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# The Green PIGS Value Chain: Assessment of the Philippine Pig Producers on Productivity and Governance

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VELP, THE NETHERLANDS

September 2021

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# **The Green PIGS Value Chain: Assessment of the Philippine Pig Producers on Productivity and Governance**

A Research Thesis Submitted to Van Hall Larenstein University of Applied Sciences in Partial Fulfilment of the Requirements for the Degree of Master in Agricultural Production Chain Management (APCM), Specialization Livestock Chains

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## **ACKNOWLEDGMENT**

Lifting all gratitude to our Almighty God, for the provision of strength, health and grace throughout this study.

A huge thanks to the Government of the Kingdom of Netherland, that through the Orange Knowledge Program, that I was able to realize one of my goals for further studies.

To my organization, ATI – International Training Center on Pig Husbandry, our Center Director, Dr. Ruth S. Miclat-Sonaco, for the support and for allowing me to pursue this endeavor.

To Van Hall Larenstein University of Applied Science, for being the instrument in realizing my goals. To the APCM Program, for the outstanding support and provision of the knowledge. To the lecturers, mentors, coordinators and staff, a word of gratitude will not suffice to show how grateful I am for all the support and shared knowledge and competencies.

To Leonoor Akkermans, my supervisor for this research, that extended her knowledge and provided the guidance throughout the study.

Much appreciation also to the Filipino Pig Producers, Extension Officers and Cooperative representative who took an active part and contribution on this study.

Lastly, to my husband Niño and son, Cedric, who keeps on inspiring and cheering me even on the hardest and challenging part of this learning journey.

## **DEDICATION**

To the Filipino Farmers, our livestock raisers and pig producers.

This study is dedicated to the persevering heroes of agriculture of my country.

“Mabuhay ang Magsasakang Filipino”

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## **ABBREBRIATION AND ACRONYM**

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
AFE	Agriculture and Fisheries Extension
ASF	African Swine Fever
ATI	Agricultural Training Institute
BAFS	Bureau of Agriculture and Fisheries Standards
BAI	Bureau of Animal Industry
BAS	Bureau of Agricultural Statistics
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
ECC	Environment Compliance Certificate
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
ITCPH	International Training Center on Pig Husbandry
LGU	Local Government Unit
NGA	National Government Agency
OECD	Organization for Economic Cooperation and Development
PCCARD	Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development
PIGS	Production, Income Generation and Sustainability
PSA	Philippine Statistics Authority
PNA	Philippine News Authority
TESDA	Technical Education and Skills Development Authority



## ABSTRACT

The Philippine livestock sector is primarily driven by the pork industry. Pig raising in the country serve as a business and livelihood to all pig producers, whether backyard or commercial. Despite that stability of the sector from previous years, the occurrence of African Swine Fever in the country as of 2019 affected the production and livelihood of the producers. Aside from the effect of the said disease to the productivity of the producer, it has affected also to the stability of supply and price in the market. Pork is the most widely consumed meat in the Philippines. And due to the limited supply in the market, the general public could not afford the meat that they are used to consume. The government and the private sector have taken initiative to rebuild the sector through various efforts such as technical and financial support. There were continuous programs implemented as of the moment. With the rebuilding in perspective, it is necessary to know and understand the ability of the pig producers in terms of productivity. It is also of concern to understand the system of governance that facilitates the flow of produce to the market and how are the pig producers deal with it.

The study highlighted on productivity, with the production, its aspects and the enabling and disabling, as the perspective. It also focused on the concept of chain governance. The relationship of the pig producers to the immediate actors and supporter was taken into perspective with this study. The study identified the cause of the decline in production, the aspect of production that the pig producers see themselves as equipped and has the ability to perform on. The study also showed the different programs of the government and the perception of the pig producers in terms of accessibility. The study also identified where the pig producers should improve on and what are the areas that the government and NGOs should look into with the facilitation of the programs that they are currently conducting.

The descriptive analysis on productivity and governance showed the current situation of the pig producers that the efforts on the rebuilding of the pork sector should be geared to. A better understanding of the ability of the pig producers and the relationship that they have in the chain will be beneficial to rebuild and strengthen the pork value chain.

*Keywords: Pork Value Chain; Productivity; Chain Governance; Aspects of Production; Access to Finance; Political-Economic Environment*

## CHAPTER I. INTRODUCTION

The uninterrupted supply of a commodity to the market stabilizes the price, making it attractive to consumers. As the law of supply and demand indicates, the interaction of supply and demand determine the price, based on the theory popularized by Adam Smith (Inoua and Smith, 2020). The more stable the supply is, price tends to stabilize also, considering that demand is constant, equilibrium is achieved. This is beneficial to consumer since there is a high probability that they will be able to access the commodity and it will be affordable for them.

The agriculture sector of the Philippines produces mainly for local consumption. The agricultural sector is composed of four-subsector, which are farming, fisheries, livestock and forestry. Agricultural produce like banana, pineapples and oil were some of the exported agricultural products, while livestock produce is all marketed and consumed within the country. Livestock production is dominated by the swine and poultry industry. Other livestock raised are cattle and goat.

The most widely consumed meat is pork. The swine industry has a considerable share on the GDP of the Agriculture sector. In 2019, the country's GDP amounted to USD 376.8 Billion. The agriculture sector contributes about twenty percent (20%) of the gross domestic product. By the year 2015, contribution of the livestock sector to the GDP increased. Animal production accounted for the highest percent share at forty-eight percent (48.5%) (PSA, 2020). Swine production is the major contributor for the livestock sector. The volume of production for swine amounted to 515.05 metric tons (liveweight) in 2019 (PSA, 2020).

Despite of the promising growth of the swine industry, the supply chain was affected by the progressing event in the country such as the incidence of ASF. Shortage in supply was experienced after the country recorded the incidence of occurrence of the African Swine Fever (ASF) in December 2019. Though it is common to experience market supply fluctuation during peak months, the incident of ASF has affected the whole supply chain. Supply becomes scarce in the market, with other area almost experienced a zero-supply incident. The intervention to combat the spread of the virus has also an implication on the productivity. As a measure, the Department of Agriculture conceptualized the 1-7-10 policy, that manages and controls the spread of the disease. The policy indicates that in a one-kilometer radius from the site of infection or ground zero, hogs will be prohibited from entering or leaving the area, and the site is to eventually be depopulated. In a seven-kilometer radius, hogs would be under surveillance with restricted movements, and blood testing would be done. For the 10-kilometer radius from ground zero, mandatory monitoring and reporting of swine disease occurrences was implemented (PNA, DA 2020).

With the event that is happening, the pig producers are in the middle of it. Production is a mean of their livelihood. They are vulnerable to the effects of the occurrence of diseases and factors affecting production. They are also vulnerable with the market situation, as the income generated from pig raising is a means of raising their families, their livelihood. The relationship that they have in marketing with regards to the immediate actors which they interact with determine the progress of their pig raising activities.

### **1.1. Background: The Philippine Agriculture Sector**

The Republic of the Philippines is a sovereign state in archipelagic Southeast Asia, with 7,641 islands spanning more than 300,000 square kilometers of territory. It is divided into three island groups: Luzon, Visayas, and Mindanao. The major industries of the country are: Mining, Utilities, Construction, Agriculture, Manufacturing and Services (TESDA Report, 2018).

The Philippines is one of the most dynamic economies in the South East Asia. Agriculture plays a significant role in the economy. The sector contributes about twenty percent of the gross domestic product. The main agricultural activity is still crop cultivation for several years prior to 2015 where in livestock production began to increase. In 2018, a total of 3,285 establishments were engaged in agriculture, forestry and fishing industry. This represents a 33.5 percent increase from the 2,461 establishments recorded in 2012. Moreover, the animal production with 1,593 establishments accounted for the highest percent share (48.5%) (PSA, 2020). Most resources for the agriculture sector are readily available coupled with the technologies and a young population that is encouraged by the government towards farming. Farming is pictured more as a business now, rather than the previous thinking that it is only about food for the table. From reliance on developing farmers to production it was brought into a higher perspective, to bring agriculture in a business context. Though this thinking is not yet fully realizable, undertakings were done to ensure to achieve this and to make agriculture not just an option for this generation as a career.

#### **1.1.1. The Pork Industry**

The livestock sector is primarily dominated by the pork industry in terms of herd population and production. Still prevalently small-scale, but remains a vital source of economic growth (Medrano, 2019). The total volume of hog production in 2020 was estimated at 2.14 million metric tons, liveweight, which is -6.7 percent lower from 2019 (PSA report, 2021). The decline in production was the result of the current disease outbreak of ASF, as recorded in 2019. Currently, measures to control the disease was taken as well as repopulation on the affected areas.

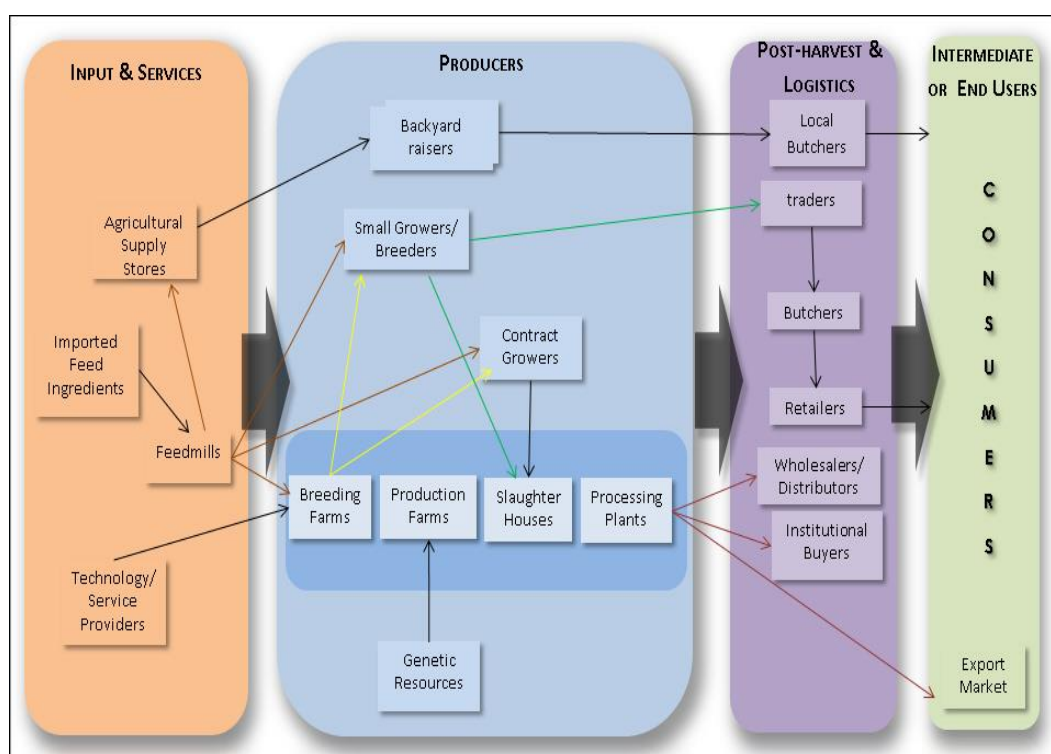
As the major type of meat being consumed in the country, the demand for pork continue to increase. This was the reason why the decline in supply translate to the increase of market price. Despite of the promising market for pork, there are challenges and constraints being faced and continue to threaten the sustainability of the pork value chain.

#### **1.1.2. The Pork Value Chain**

The pork value chain in the Philippines is widely dominated by small scale producers. As reported by the Philippine Statistics Authority, as of 01 October 2020, the total swine inventory was estimated at 11.27 million heads, lower by -13.4 percent from the 13.01 million heads count in the same period of 2019. Population of swine in both backyard farms and commercial farms posted decreases of -5.4 percent and -27.0 percent, respectively. Of the total swine inventory, 68.8 percent were raised in backyard farms while the remaining 31.2 percent were from commercial farms.

MADECOR, a private consultancy company, devised a pork supply chain through the cooperation of the government agencies and bureaus. The supply chain, as illustrated in Figure 1., determined the different actors of the pork value chain and the processes of the chain.

Figure 1. Supply Chain of the Philippine Hog Industry



Source: MADECOR, 2018

## 1.2. Research Problem

The stability in terms of supply of the pork value chain becomes a major concern, not only of the Department of Agriculture but also of the government. As a result of the disease outbreak (ASF), the country was put on state of calamity due to the plummeting supply of pork in the market and unstable market prices (Presidential Proclamation 1143, 2021). There are uncertainties as to when the sector will be able to regain the production despite the ongoing programs of the government to repopulate the affected areas. These uncertainties call for the assessment of the current value chain, its actors and supporters, to further gain insights on the current situation of the industry.

With the increasing concern on the stability of market supply and the security of the swine industry in the midst of the declared state of calamity, the Department of Agriculture was tasked to spearhead in addressing the situation. All bureaus and agencies under the department has committed to share this responsibility. Agricultural Training Institute with its mandate to lead in the formulation of the National Agriculture and Fisheries Extension (AFE) agenda and budget, and prepare an integrated plan for publicly funded training programs in agriculture and fisheries, takes the responsibility of creating and developing agenda that will help the swine sector to regain its productivity.

This research is commissioned by the DA – Agricultural Training Institute – International Training Center on Pig Husbandry. DA ATI-ITCPH is a specialized training center for pig husbandry. The focus of the organization is to equip the agricultural extensionists, the farmers and other stakeholders toward a sustainable pig production. It has a mandate to empower its clientele through enhancing knowledge and skills on swine management that would result to their goals of productivity and profitability. The center needs to have a concrete information on the ability of the pig producers, in terms of technical skills and aspects of production, to be able to device programs, trainings and input to policy directives that would assist in the rebuilding of the pork value chain.

The study area will cover the country, the Philippines, as a whole. This was represented by the selected high producing provinces of the island group of Luzon, Visayas and Mindanao. This is to have an overview on whether each island group have similar or differences in concerns to production and governance since the geographical feature of the country is a unique factor on its own.

### **1.3. Research Objective**

The research objective of this study is to assess the pork value chain, specifically the pig producers' situation to be able to gather information that will contribute to the development of appropriate trainings for the stakeholders, input to the "Hog Industry Road Map" and policy formulation that will aid in the re building of the pork industry.

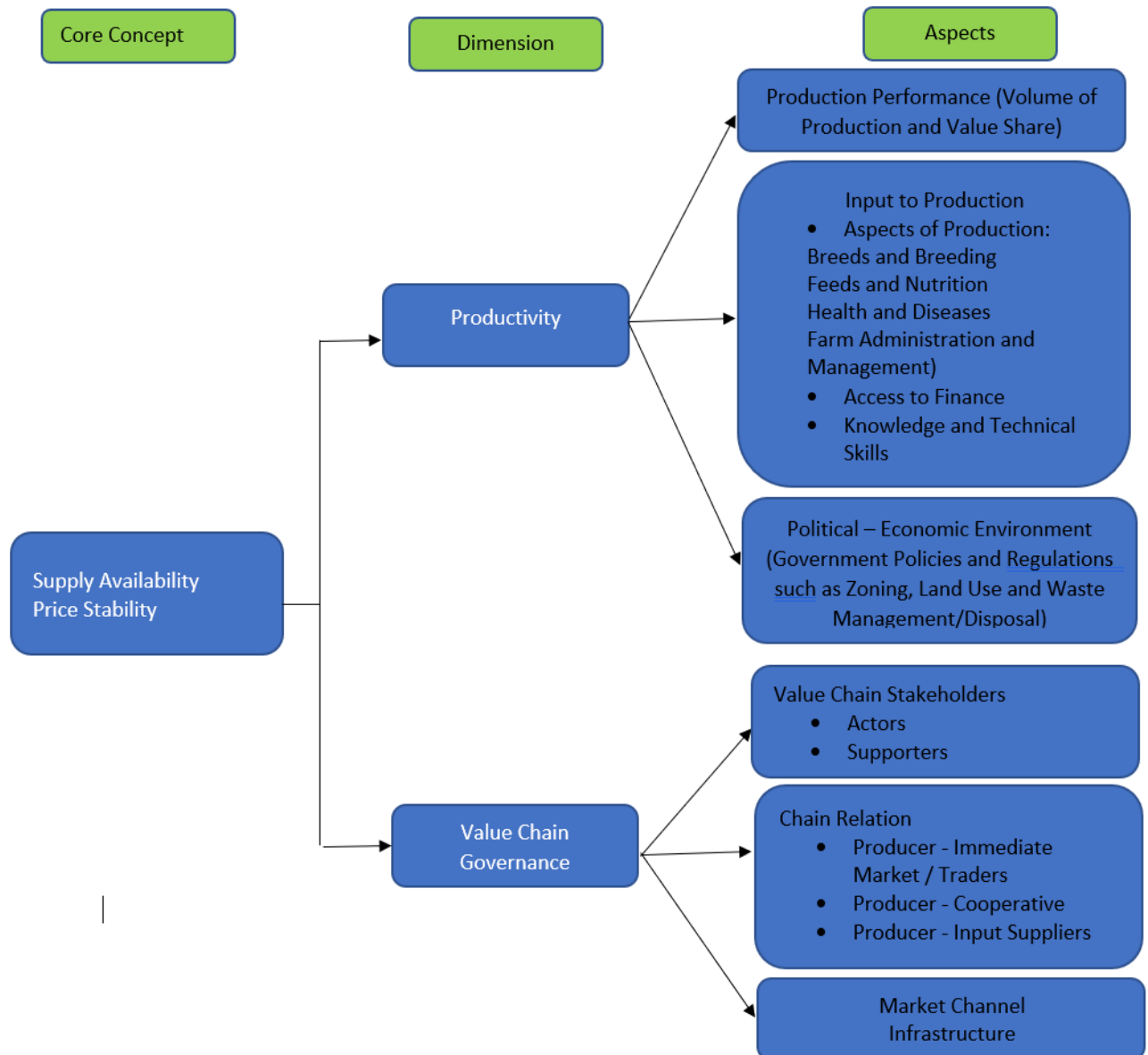
### **1.4. Research Questions**

1. What is the current situation of the pork sector in the Philippines?
  - 1.1. What is the production performance of the pork sector?
  - 1.2. What are the factors that affect productivity of the pig producers?
  - 1.3. What are the enabling/disabling environment affecting productivity of the pig producers in the three-island group?
2. What is the governance structure in the pork value chain?
  - 2.1. Who are the stakeholders (actors and supporters) and their roles?
  - 2.2. What is the chain relation among the farmers and the immediate actors and supporters?
  - 2.3. What are the different market channels and infrastructure categorized by the three-island group, that are available for the pig producers?

### 1.5. Conceptual Framework

The value chain concept gives an overview of the whole pork industry. Assessing the supply availability through the chain map, stakeholders (actors and supporters) analysis, production and market access are all within the value chain concept. Productivity concept through the aspects of production, economic, access to training and government policies will be used as aspects.

Figure 2. Operationalization of the Conceptual Framework



Source: Author, 2021

## **CHAPTER II. LITERATURE REVIEW**

### **2.1. Productivity**

As generally defined, productivity is the ratio between the output volume and the volume of inputs. In this perspective, it is viewed as the proper utilization of all inputs to production to create the highest possible output (OECD). The input to production ranges from the tangible inputs such as fixed asset, monetary value and inventory. It also includes the knowledge and technical skills that can be accounted in the production of the product to be sold in the market. Agricultural produce such as livestock has its own set of inputs to generally produce the live animals for sale after months of rearing.

#### **2.1.1. Production Performance**

Production performance depends on the total production of the whole sector. According to PSA, 2020, in reference to the Philippines, volume of production is the volume of the locally-raised animals disposed for slaughter. This includes the animals that are being shipped out or sold to other regions and provinces. Generally, the unit used is metric tons.

The performance is also measured by comparing the inputs to production and the volume of produce that the farmers are able to sell. The cost and revenue are used to determine the gross margin (KIT and IIRR, 2008).

According to ABARES (Australian Bureau of Agricultural and Resource Economics and Sciences), in measuring productivity, it is appropriate to use the total factor productivity which is the measures that captures all the outputs, such as livestock, crops and other farm products and inputs that are used in production. This is also known as the multifactor productivity, that considers a farm as a unit and as a whole.

#### **Production Output**

The volume of production denotes the number of pigs that reached marketable age and are ready for market. It refers to the volume of locally-raised animals disposed for slaughter which include animals shipped-out to other regions/provinces (PSA, 2020). This is expressed in metric tons, liveweight. In a farm context, it is an individual farm production performance or the number of animals reared and are ready for market. The level of the production output depends on the type of farm as well as the size. The small-scale livestock producer there are an inventory of any of the following: (1) Less than 21 heads of adult and zero head of young; (2) Less than 41 heads of young animals; and (3) Less than 10 heads of adult and 22 heads of young. This will yield to a smaller output considering that inventory for breeder and production is lower as compare to medium and large-scale producers.

#### **2.1.2. Input to Production**

There are various practices in pig raising. As described by van't Klooster and Wingelaar, (2011) pig farming in the tropics is classified as free range to small scale intensive pig production. There are three typical pig systems, namely:

1. Free-range scavenging pig keeping

A domestic scale, or rearing done by a family to provide funds for the family. It can be described as less extensive, little investment of time and money.

2. Semi-intensive pig keeping

In this system the animals are housed and more attention is paid to their health and feeding. The aims are partly the same as those of domestic pig keeping, but with modest inputs. Production is higher and the pigs are also marketed.

### 3. Intensive pig keeping

This system aims at producing meat for the market efficiently and profitably, usually with larger numbers of pigs. It requires significant inputs of time and money, with careful calculation of the costs and the resulting benefits.

Pig production in the Philippines is classified based on the economic entity or farm type. A farm is either backyard or commercial. A backyard farm is defined as having less than 10 sows per household (PSA, 2020). These farms purchase commercial feeds, have no business permits, and generally lack farm records.

Commercial farms, on the other hand, are classified into small, medium, and large. Small commercial farms maintain less than 100 sows and purchase commercial feeds. Medium-scale farms have 100 to 300 sows, business permits, and specialized farm structures. Some mix their own feeds. Meanwhile, large-scale farms operate more than 300 sows, own boars and breeders, and implement artificial insemination (AI). They also operate their own feed mills, keep computerized farm records, have business permits, and usually have a water treatment facility for the farm (PSA, 2020).

A key feature of the Philippine pig industry is the small holder production system (termed smallholder farms). Small-holder farmers, as defined by the Philippines Bureau of Agricultural Statistics (BAS), were farmers raising one to 41 pigs (young or adult) in their backyards per year. Commercial farms as defined as farms which satisfy at least one of the following conditions: (1) at least 21 head of adult pigs; (2) at least 41 head of grower pigs; or (3) at least 10 head of adults and 22 head of grower pigs. The commercial production system represents 30% of the Philippine pig industry (PSA, BAS, 2011).

There are four primary types of swine operations: farrow to finish, weaner production, finisher production and breeder production.

According to Field, 2012, there are five classification of swine operations (1) farrow-to-finish (2) farrow-to-feeder pig production (3) feeder finishing production (4) farrow-to-weaner, and (5) Purebred or seedstock.

The following are the input to production for pig production:

A small-scale production relies on a little external input. They utilize the use of readily available materials for housing, alternative feeds and at time uses a native animal genetic or an upgrade breed. It is rare that they utilize pure exotic breeds for the production.

For the large-scale production, utilizing intensive methods of rearing animals, input to production is incomparable to the small scale. Large scale producers use good genetics for breeds, usually cross breeds depending on the purpose of production, commercially formulated feeds with high densities and nutrients, has a health programs and disease prevention. Housing is technically based on appropriate climatic condition.

The productivity of the pig depends on the breed and the overall management (Dietz, 2011), which in turn gives a farmer more animals to sell. This productivity is associated with the inputs to production.

### **Aspects of Pig Farming**

There are areas of focus or components of pig farming. These areas can also be referring as the categories of the input to production. In most operation, these aspects are: Breeds and Breeding; Feeding and Nutrition; Farm Administration and Swine Management, that includes physical facilities; Health and Diseases.



## 1. Breeds and Breeding

In pig farming, breeds have become a significant part and consideration. The importance of reproduction is at least twice as important as the economic returns. It is considered as an important aspect of pig farming (Field, 2012).

Breeds of swine are genetic resources available to swine producers (Field, 2012). The most common pig breeds in the Philippines and the Southeast Asia are as follows:

- 1.1. Landrace
- 1.2. Large white
- 1.3. Hampshire
- 1.4. Berkshire
- 1.5. Duroc
- 1.6. Pietrain

In production of finisher, an F1, a cross breed progeny, is used as sow, with the intent of producing meat type pigs (Field, 2012).

Most farmers utilize the breeds mentioned above, while there are also farmers who raise native breeds that are relatively smaller in body conformation compare to the breeds mentioned above. The native breeds usually are processed to specialty products such as “lechon” and are being sold for the niche market. Traits of high economic importance that are included in most selection programs are (1) sow productivity; (2) growth rate; (3) feed efficiency; (4) carcass traits and (5) skeletal soundness. Due to this, breeds are seen to play an important factor to production and in the goal of production. Most farmers cross breed their animals to obtain the desired traits of animal, and to attain the desired final product.

As described in ITCPH Manual “Breeding systems are systems of mating animals to produce a pure breed or a crossbreed. These are the methods employed by breeders for breeding animals. The system of mating is particularly important in pig improvement since use of the correct system can greatly increase production. There are four systems of breeding, namely: (1) Inbreeding; (2) Pure breeding; (3) Crossbreeding; and (4) Upgrading.”

Based on the MSD Manual and ITCPH training manuals, there are three methods of breeding. These are pen mating (boar run with females), hand mating (supervised natural mating), and artificial insemination (AI). There are still a number of small-scale producers that utilizes the pen and hand mating, though artificial insemination is gaining accessibility and popularity to the raisers.

In order to improve the efficiency and profitability, livestock managers took interest in manipulation of the reproductive patterns of farm animals (Field, 2012). Crossbreeding in swine is widely used whereby the outstanding traits of two or more breeds are combined and heterosis increases the pound of market pigs sold per litter. With this practice, artificial insemination becomes a popular. “Artificial insemination is defined as the process wherein the semen is deposited in the female reproductive tract by artificial techniques rather than by natural mating. The advantages of AI are the extended use of sires, controlling reproductive diseases, and using sires that have been injured or are dangerous when used naturally.”

According to Hulsen et. al, 2015, reproduction is not a stand-alone procedure, as skills are needed to have a good turn of the practice.

## 2. Feeding and Nutrition

Pigs need energy for growth, maintenance and reproduction. The main source of energy is the feed intake of any specie of animal. Feeds form part almost seventy percent of the production cost (ITCPH Manual, 2018). The proper combination of nutrients and minerals such as amino acids, vitamins in sow rations and baby pig rations ensure adequate and cost-effective gains (Field, 2012).

Feeds compose up to seventy percent (70%) of production cost, that can be translated as a major input to production. Good breed should be supported by proper feeding and nutrition. The function of nutrients, that pigs are gaining through feeding, is for maintenance, growth and reproduction. There are various sources of feeds. Farmers have options of using readily available feeds in the market or produce their own feedstuff. For convenience, preference to a balanced diet (nutrient inclusive) feed is common for commercial farms.

There are protocols adapted in feeding. In this sense, knowledge to feeds and feeding is a must. As such, gradual changing or transition period should be gradually done in shifting ration and type of feed in order to not upset the normal feeding behavior of the pigs. Always allow a transition period of at least one week before making changes (DA-BAR, 2012).

There are several feeding methods or management that are utilized by farmers. These are ad-libitum, restricted feeding and combination of both. Aside from the feeding management, most farms also consider the use of the feeding guide where there is schedule of shifting of the quantity of feeds, depending to the stage and age of the pigs (ITCPH Training Manual, 2018). Aside from the feeds, water should always be available and accessible for the animals.

## 3. Farm Administration and Management

The main aim in pig farming is to earn profit. To attain such, the level of production (output) should be maximized through good management and optimum use of available resources (ITCPH Training Manual, 2018).

### 3.1 Farm Administration

Farm Administration can be defined as the systematic gathering/collecting of data, working out, analyzing and judging of these technical farm data for a production period in order to obtain a better management approach.

### 3.2 Housing

Housing plays an important role in pig production. It can affect the performance of the animals and eventually the outcome of the farm. There is no standard type or system of housing for pigs. Instead, accommodation and equipment are chooser to suit the type of management system adopted (FAO, 2009). According to ITCPH Training Manual, housing should be designed and constructed to facilitate the freedom and individual comfort of the pigs, labor saving, herd health and sanitation, bedding conservation and manure disposal.

### 3.3 Bio-Security

Biosecurity of pigs at the farm level is the set of practical measures taken to prevent entrance of infection into the pig farm and control the spread of infection within that farm (Levis and Baker, 2011). The many measures that can be used to improve biosecurity can be categorized in several ways. One way is to classify measures

according to three goals: isolation, sanitation and traffic control (Levis and Baker, 2011).

### 3.4 Waste Management

Wastes are derived from pig farming. These wastes are composed of the animal manure, urine and water used in cleaning the pens. There are contaminants present in pig farms in the Philippines. Manure, urine and water used in cleaning are the major contributors of animal wastes (ITCPH Training Manual, 2018).

## 4. Health and Diseases

Herd health programs must be well planned to prevent reproductive diseases, ensures adequate lactation, and prevent scours and other disease of the baby pigs. (Field, 2012). It can be generalized that a well determined and planned health protocol minimizes the exposure to a known disease. According to Hulsén, 2015, diseases and disorders follows similar basic principle which is early detection and treatment will yield to smaller damage. The prevalence of disease occurrence is always present. Emerging and re-emerging pathogens pose a significant threat to livestock industries across the globe, as they can have serious impacts in terms of livestock morbidity and mortality, production losses, consumer demand and costs associated with treatment and control (Brown et al., 2020).

Disease control measures such as movement bans, culling and vaccination (when available) can be used to reduce the frequency of disease already present in a population by eliminating causes of disease or reducing them to levels of little or no consequence (Brown et. al., 2020)

### **Access to Finance**

Aside from production, another aspect that is often overlooked at is the economic. Many sustainability studies focus more on environmental or welfare issues, on how to measure them, to implement them. In many studies, economic sustainability is rarely taken into account, or as a secondary part of the work often reduced to viability (Ilari et. al, 2014).

Economic aspect plays part in the pig farming practice. Knowledge on proper financial management is an aspect that is also of concern. In pig farming, concerns on financial is already present even before a farmer starts. Pig farming, like any other business activity, requires capital to start operation. Components of the production requires the fixed assets such as land, building and equipment. Other assets needed are the stocks, breeders, feed inventory and biologics. Aside from this, it requires proper financial handling to support the daily activities of the farm.

The availability of sufficient fund eases the operation. As such, not all pig producers have enough money to finance the operation. It is critical to be able to have funds to invest in the farm and thus could result to productivity. Aside from productivity it also improves post-harvest practices, family's own income and promote better management. Access to a comprehensive range of financial services is a significant challenge for smallholders, who constitute the vast majority of farmers in developing countries (IFC, 2014).

### **Knowledge and Technical Skills (Training and Capacity Building)**

Training and capacity building is a tool utilized by both public and private providers to extend knowledge and skills to their beneficiaries. Different programs have been initiated through ATI, the training arm of the Department of Agriculture in the Philippines. With this, it is expected to see improvements in the practices and productivity of farmers. Analysis of findings on Malaysian livestock farmers indicated that 79% or majority of them shows improvement on productivity when they

accessed training and was able to work faster. In short, it can be said that without attending those training courses, the farmers would not be able to improve their productivity. Farmers nationwide revealed that the impact of training has been positive and had made them become better managers in their farm practice (Noor et. al, 2011). As such, even private and non-government organization utilize training to extend their support to farmers.

### **2.1.3. Political – Economic Environment**

Policies and regulations are existent in order to protect not only the environment but also the stake of the people. Pig raising in the Philippines is governed by different policies and regulations in order to maintain it.

According to Administrative Order 41, series of 2000, denotes the minimum standards for animal welfare that takes into consideration the five-basic freedom of animals. To summarize, these five basic freedoms are: freedom from thirst, hunger and malnutrition; freedom from physical discomfort and pain; freedom from injury and disease; freedom to conform to essential behavior patterns; and freedom from fear and distress.

As to the permitted location for pig farming, the resolutions required that such farming is not allowed in urban areas and are obliged to use chemical pest control and minimize pollutants. As for “backyard” farming or small-scale farming, it may be allowed on urban areas provided that only thirty percent in the lot areas for the urban will be utilized for pig and poultry farming (HLRUB Resolution No. R-674, series of 2000). This resolution also promulgates zoning and other land use control standards and guidelines which shall govern land use plans and zoning ordinances of local government.

In case of the environment concerns, Republic Act (RA) 9275, also known as the Clean Water Act of 2004, has a direct influence in the waste management protocols on pig raising and beyond. In line with this, Ramon J. Paje, DENR Secretary, 2013 calls on poultry and piggery owners to put premium on pollution control and wastewater treatment facilities to ensure that the wastes generated by their operations will not affect the surrounding environment and the health of the people in their respective communities.

Aside from the mentioned proclamations and resolutions, the pig raising activities is also governed by mandates of the Good Animal Husbandry Practices; RA No. 10601, An Act Promoting Agricultural and Fisheries Mechanization Development in the Country; RA No. 8435, An Act Prescribing Urgent Related Measures to Modernize the Agriculture and Fisheries Sectors of the Country in order to Enhance their Profitability, and Prepare the Said Sectors for the Challenges of Globalization through an Adequate, Focused and Rational Delivery of Necessary Support Services, Appropriating Funds Therefore and for other Purposes. The two RAs focused on modernizing the sector and provide the drivers for such modernization.

### **Opportunities and Challenges of the Pork Value Chain**

The following were the pre-determined opportunities and challenges that was generated from the Hog Industry Roadmap that was conceptualized for the administration of 2016 to 2022. The roadmap was the output of the collaboration from pig producers’ representatives, Local Government Unit, Agricultural Extension and the National Livestock Program.

Table 1. Opportunities and Challenges, Pork Sector

Opportunities	Challenges and Constraints
<ol style="list-style-type: none"> <li>1. Availability of affordable input to production</li> <li>2. Public-Private Partnerships</li> <li>3. Growing domestic market <ul style="list-style-type: none"> <li>- Increased demand</li> <li>- Changing eating habits and living standards (condominium living) of Filipinos</li> <li>- Growing tourism industry</li> </ul> </li> <li>4. Low per capita consumption for pork</li> <li>5. Potential export market</li> </ol>	<ol style="list-style-type: none"> <li>1. Disease Occurrences <ul style="list-style-type: none"> <li>- Entry of emerging and new diseases (ASF)</li> <li>- Possible recurrence of FMD</li> </ul> </li> <li>2. Trade (Import) Liberalization <ul style="list-style-type: none"> <li>- Entry of imported pork</li> </ul> </li> <li>3. Urbanization (communities encroaching on swine growing areas)</li> <li>4. Government Policy <ul style="list-style-type: none"> <li>- Environmental compliance (LGUs, ECCs, DENR, EMB)</li> <li>- Changes in land use and zoning guidelines</li> <li>- Proposal on foreign ownership of public land (BOI policy)</li> </ul> </li> <li>5. Insurgency problems</li> <li>6. Vulnerability of livestock production due to climate change</li> <li>7. High cost of production compared to competitors from other ASEAN countries.</li> </ol>

*Source: Hog Industry Roadmap, 2016*

Aside from the mentioned opportunities and challenges during the collaborative meeting of different stakeholders, in a report from DOST-PCCARRD in 2016, it is noted that despite being dynamic and technologically advanced, the local pig industry is still confronted with inefficiency of production due to low sow productivity, high mortality due to inefficient diagnostic tool, and lack of native pig genetic resource conservation, improvement and utilization initiative.

According to Lamy et. al, 2012, livestock productivity is therefore the outmost importance as breeder's income, livelihood and ultimately the survival of the entire population. The swine industry in the Philippines is similar with other countries in terms of features and situation. A study on Nairobi Pork Chain found that the main challenge of Kibera farmers was the lack of capital and land to enable them to expand their farms. The diminishing land sizes often lead to conflicts with crop farmers when the pigs are unconfined. Access and availability of feed was also an important challenge (Murungi et. al, 2021). In comparison with the mentioned challenges in Philippine context, there is a similarity in terms of the input supply of feeds and the constraints with the zoning.

The situation resulting to constraints is not limited only to the country. In a study conducted for Haryana District in India, enumerates various socio-economic constraints that affect the pig farming enterprise. These constraints are: access to institutional loan; inadequacy of veterinary services, particularly vaccination for disease prevention; lack of proper market infrastructure, both for input and output; inadequate training and capacity building for technical knowledge; and feeds availability and nutrient deficiency (Sahu et. al, 2018).

## 2.2. Value Chain Concept

The value chain concept was first introduced by Michael Porter in 1985 wherein he defines it as value as maximum amount an individual is willing to pay to procure a good or avoid something undesirable

from the provider. Initially, this concept was introduced as a template to analyze the value chain in a manufacturer. The perspective on this becomes wider as it also analyzes the other players along the supply chain, and also deals with more than just the manufacturer. Various efforts have been based on the recommendations of a value chain analysis in an effort to increase the competitiveness of the various players and encourage equity across the supply chain.

The value chain describes the full range of value adding activities required to bring a product or service through the different phases of production, including procurement of raw materials (Kaplinsky and Morris, 2001). This enables the desired product reached the consumer. Each process has actors that performs the process, and requires input to be able to produce. In the case of pig farming the final product range from carcass, choice meat cuts, processed meat and specialty products delivered and made accessible through different market channels to reach the final consumer.

Value chain analysis is a strategic analysis tool that is used to better understand competitive advantage, to identify where customer value increases or decreases cost, and to better understand the company's relationship with suppliers, customers and other companies in the industry. Value chain analysis rests on segmentation of the different activities and mapping of interaction that may generate (Kaplinsky and Morris, 2001).

It is the evaluation of findings of the value chain research out of which a strategy for value chain development and specific interventions evolved.

### **Value Chain Governance**

Market participation of the small-scale famers assures them of benefit that would improve their social and economic situation (Dietz et. al, 2011). In doing such, a relationship is formed between the different actors in the chain. This relationship brings the product from the producers to the final consumers. In this context, governance is defined as relationships among chain operators, and with service providers and regulatory institutions. This also determine the quality of the produce, the amount demanded to be produced and supplied in the market. It is typical that there is a lead actor steering the relationship among the actors of the chain.

In concept, according to Gereffi at. al, 2005, governance is central to the value chain approach in the global context. It is also relevant to the development of research and policy since its concept refers to the inter-firm relationships and institutional mechanisms through which even non market, or those who are not actors of the chain but do have activities related to the chain, takes place. This is highly relevant to coordination which is achieved through setting the information and process parameters within the chain. Product and process parameters are also set by government agencies and international organizations concerned with quality standards or labor and environmental standards. To the extent that external parameter setting and enforcement develop and gain credibility, the need for governance by buyers within the chain will decline.

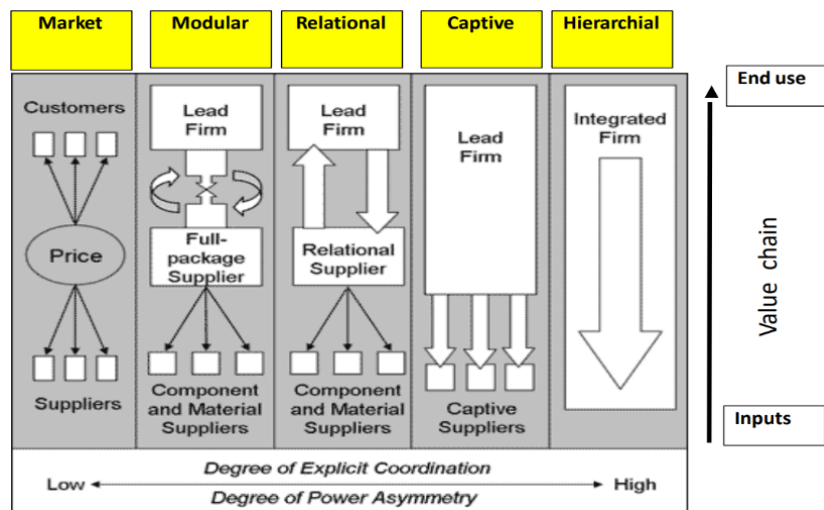
### **Governance Structure**

According to Haggblade, 2012, the distribution of power and information among the actors of the chain is reflected by the chain governance. The structure is further described by the chain coordination, power relations and the political-institutional framework. Chain coordination is usually described by the lead firm, or the lead actor. The lead firm decides what, how and when a certain product is to be done. The feature and the standards of the product to be produced is governed by the lead firm, for they are the one dictating the producer on what and how to produce. At some point, they also decide the price of the product. The power relations denote the influence of an actor and how strong they affect the other actors of the chain.

### Type of Value Chain Governance

Activities within the chain, for instance producing, supplying and processing, is described with the connection that assures the continuation to the market. The relationship is close to each other, or relationship among immediate actors, extending as a vertical sense (Marketlinks, USAID). There are different types of network-style governance: Market, modular, relational, captive and hierarchical. The type of governance represents which among the actor act as the lead firm, exercising power and influence through coordination (Sturgeon, 2008).

Figure 3. Types of Value Chain Governance



Source: Gereffi et. al., 2005

The table below further describes the types of value chain governance:

Table 2. Types of Value Chain Governance

Typology of Governance	Description
Market	Characterized as a relatively simple. The transfer of information on product specification and required quality and quantity is easily transmitted. Products are easily developed and designed with a minimal input from the buyers. This also requires a little or no formal cooperation between actors and stakeholders. In this case, the buyer has no controlling interest in the production, sets few if any standards, and provides producers with little to no information on what the market wants and how to produce it. The standards or parameters is defined by each producer. The lead firm has less power and influence, rather price dictates the governance.
Modular	This is the most market-like of the chain network governance patterns. The customers specification becomes the basis of the producers and suppliers on how they will make their products. Buyer – Supplier interaction can be described as complex. Linkages (or relationships) are more substantial than in simple markets because of the high volume of information flowing across the inter-firm link, but at the same time, codification schemes can keep interactions between value chain partners from becoming highly complicated and difficult to manage.

Relational	Mutual reliance regulated through proximity, social relationships and reputation, generally characterized relational governance. Though this is established on mutual dependence, there is still a lead firm that specifies the needs and exert control over the chain.
Captive	The few buyers with more power and control best describe this type of governance. The high degree of monitoring and control is done by the lead firm. Small suppliers are greatly dependent on the buyers.
Hierarchical	Hierarchical governance describes chains that are characterized by vertical integration and managerial control within a set of lead firms that develops and manufactures products in-house. This usually occurs when product specifications cannot be codified, products are complex, or highly competent suppliers cannot be found.

*Source: Marketlinks, USAID*

### **2.2.1. Stakeholders of the Value Chain**

The following are the stakeholders of the value chain.

#### **1. Chain Actors**

These are people, group of people and organization that have a direct link in the value chain. They have functions that are necessary to complete the flow of product in the chain until it reached the final consumers. These functions are: input supply; producing; processing; wholesaling and retailing and consuming (Stein and Baron, 2017).

#### **2. Chain Supporters**

These are people or group of people and organization, may be government and non-government, public and private, providing support and assistance to any of the chain actor. This enables the chain actor access to knowledge, skills, resources and any other support that help the organization of the value chain.

### **The Stakeholder Analysis**

The process of identifying the individuals and organization who has a “stake” in any activity is termed as stakeholder. Identifying the ‘stakeholders’, large and small, individual and organizational, for any given activity is essential if all the people who could have a bearing on its success or failure are to have their voices heard.

### **2.2.2. Chain Relation**

The activities and interaction between actors of the value chain is governance. This is also referred as the relationships between the different chain actors that operate the range of activities required to bring a product or service from inception to its end use (KIT and IIRR, 2008). Such relationship does not only exist between seller or producer and buyers (or traders), but it extends beyond the vertical set up. For governance, the chain governance is primarily characterized as the vertical relationship, among the actors of the chain but a relationship also occurs horizontally, that is with the supporters of the actors of the chain. In this context the trading relations is the is where governance is. The chain relations can be characterized into strong and weak chain relations. Strong chain relation is the ideal setup that is desired within the market. This is characterized as an organized farmers and traders, there is organization and trust. On the other hand, weak chain relations are visualized with few



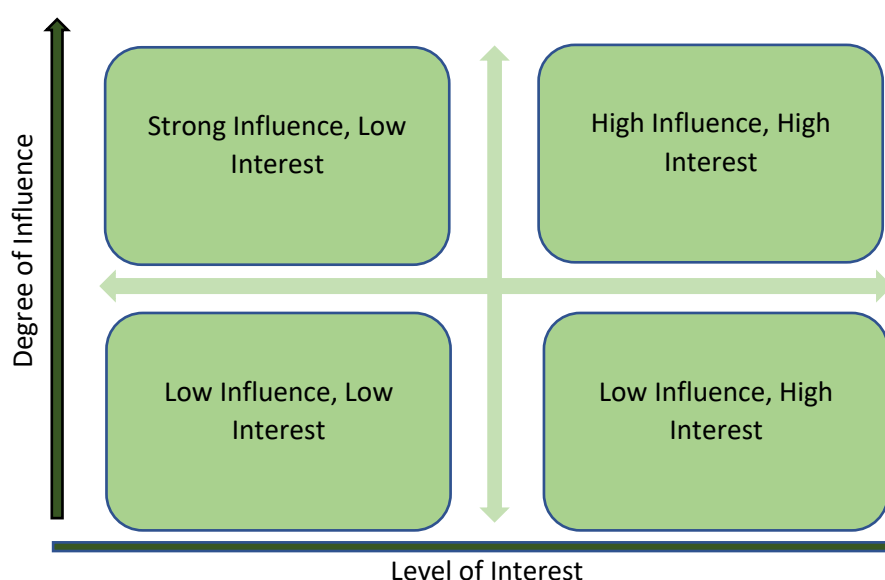
organizations, few permanent relationships and could not establish trust between the farmers and traders.

There is an explicit concern over power and interest in the value chain. Chain relations lies on power, trusts and information. As described, power is a multi-faceted social phenomenon, it is embedded at the core of human relations and is also multi-faceted (Brouwer et. al, 2012). It has an ability to influence, control people and events. This in turn will likely to favor the person and organization who has the “power over” or influence. Value chain governance exists when the power and influence, as that of the lead firm, that the other actors or firms adheres to the parameters that are set (Marketlinks, USAID).

### The Power-Interest Matrix

The matrix, or the power-interest grid, is used to categorized the stakeholders within the chain. This helps visualize where a certain actor lies within the chain, the level of their interest and influence. This also shows their vulnerability and how they can be affecting the other actor of the chain.

Figure 4. Power – Interest Matrix



Source: Mendelow, A.L. 1981

### 2.2.3. The Market and Market Channel

In animal production, the end product for the livestock raisers are usually live animals. The most common set up of the chain is that farmers sell their live animals with the traders, though there is also auction markets for ruminants and other livestock. The pig producers go to different venue and method to sell their produce. The large-scale producers and contract growers are usually contract exclusive wherein there is already existing buyers for the animals. Small scale farmers usually relay on cooperatives, if they are members but non-members usually sell with a trader or to any person who would want to buy their animals. A case study done by Rubzen, 2002, in Leyte, a province in the Philippines, found out that the most common method of marketing is that traders or middlemen pick up the animals from the farm. This saves the farmer from transportation cost however the price given by the trader are relatively low. It is not a sole practice by this country, in research conducted for the pork value chain in Benin, the most common path that the produce to come to market is through stockbreeder, trader, butcher, and consumers (Govoeiyi, 2019).

According to Sumalde and Quiloy, 2015, the farmers are the most affected player in terms of marketing as they are vulnerable to lower price offers, interlayer market intermediaries and limited access to profitable markets.

Options of the Pig Producers to Market (Ayomen, 2019)

1. Pig Producers to Traders (Traders to market, processors and consumers)
2. Pig Producers to Cooperative

### CHAPTER III. METHODOLOGY

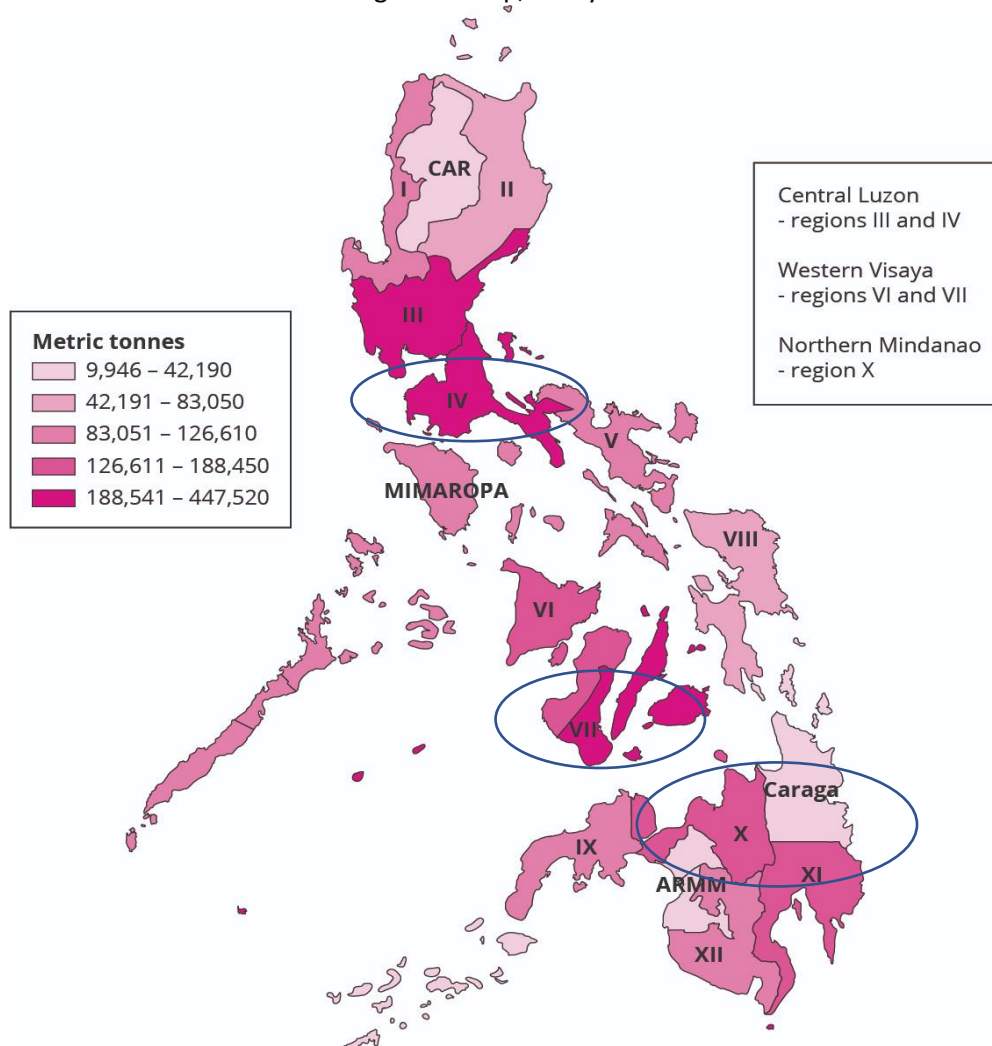
This chapter covers the study area, research strategy and methodology. It also discussed the sampling method and the analysis of data.

The study used quantitative and qualitative approach in data gathering and analysis. Data collection, both primary and secondary data, were collected from the period of June to August 2021.

#### 3.1. Study Area

The study covers the perspective of the pig producers coming from the different island groups of the country, with primary focus on the highest producing regions as of 2020.

Figure 5. Map, Study Area



Source: PSA, 2021

Luzon Island, generally represented by Region IV-A, CALABARZON.

Region IV A, CALABARZON, is a region located in the Luzon. It has five provinces, namely, Batangas, Cavite, Laguna, Quezon, and Rizal. The regional center is the City of Calamba. CALABARZON is bordered, by the National Capital Region, Laguna de Bay, Central Luzon, Philippine Sea, Bicol Region, Ragay Gulf, Sibuyan Sea, Tayabas Bay, Verde Island Passage, South China Sea, and the Manila Bay. The region is known as the industrial powerhouse of the country due to the continuous industrial development within the different provinces of the region. Industries ranges from automobile,

electronics and petrochemical industries. Despite of these industries, agriculture and livestock still have a huge impact of the total productivity of the region.

The total land area of the region is 16,873.31 km<sup>2</sup>. Out of the total area, 588,500 hectares are devoted to agriculture. The total population of the region is 16,057,299 as of 2020 and it is projected to increase to 17,477,569 by 2025.

The total pig produced as of 2020 amounted to 348,511 metric tons in liveweight, contributing to 16.3% of the national production. This made the region the highest producing region as of 2020.

Visayas Island group, generally represented by Region 7, Central Visayas.

Region 7, Central Visayas, lies in the center of the Philippine archipelago. It is the second smallest region in the Philippines with a total land area of 14,923 square kilometers. This constitutes about 5 percent of the country's land area. It is composed of the provinces of Cebu, Bohol, Negros Oriental, and Siquijor. It is also well known for its tourism industry. The region is one of the most developed and fourth largest economy in the country, considering Cebu is one of the business hubs in the country. Central Visayas hosts many industries, including footwear, ICT & IT enabled services, electronics, wearables, food processing, marine, houseware and furniture, among others.

Central Visayas is the sixth smallest region in the country with a total land area of 1.49 million hectares (14,951 square kilometers). Population, as of 2020, reached 7,957,046 and it is expected to rise to 8,391,707 by 2025.

The total pig production of 2020 is at 192,871 metric ton, liveweight, contributing 9% to the national production.

Mindanao, generally represented by Region 10, Northern Mindanao

Region 10, known as Northern Mindanao, is strategically located at the southern part of the country. The region is highly diversified, not only in terms of industry by as to religion as well. Mindanao, holds the largest population of Muslim in the country. Despite of this, pig production still flourished in the area. Export commodities are also abundant in the region, such as agricultural produce (coconut, banana and pineapple).

The region is composed of five provinces, namely, Misamis Oriental, Misamis Occidental, Bukidnon, Lanao del Norte and Camiguin. The total land area of the region is 20,186 sq km. Total population is 5,017,051 as of 2020, and is expected to rise to 5,273,604 by 2025.

The total pig production in the region is 210,032 metric tons, liveweight in 2020, contributing to 9.8% of the national production.

### **3.2. Research Strategy**

The research strategy used in this study are: Survey and Desk Study. Research methods used are: Semi-structured interviews to key informants, structured survey questionnaires for the pig producers, and focus group discussion among the pig producers.

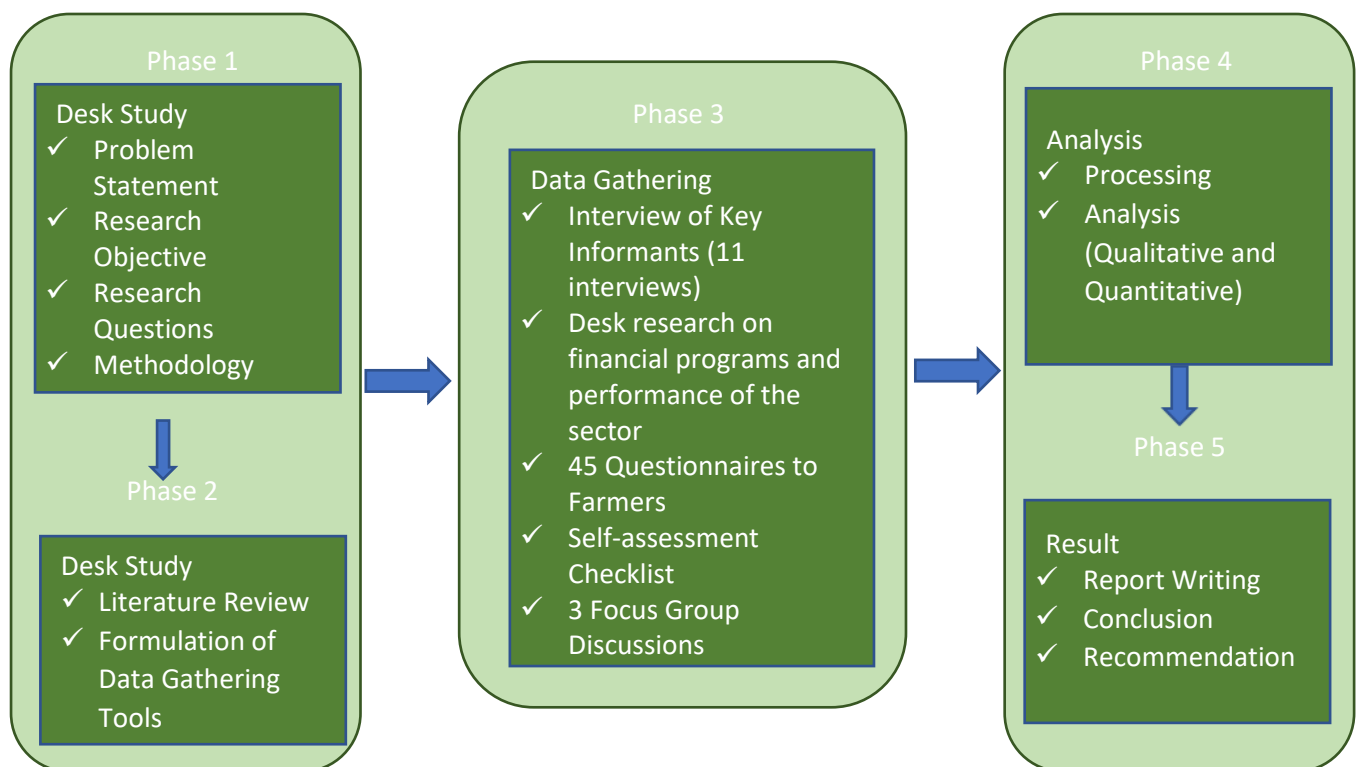
The sampling method used in this research is qualitative sampling, using purposive samples. The particular group of people that is determined as respondents for this research are pig producers, generated from Center's alumni database and as provided by the Agriculture Extension in the regional level. To better categorized the sample, the respondents will be coming from the different provinces of each island group (Luzon, Visayas and Mindanao). A total of forty-five respondents, with fifteen respondents from each island group composed the sample. Survey was used to obtain information

such as farmer's profile and practices, perspective on the type of governance or relationship that they have within immediate actors on the chain, and their access to the services provided to them by either government or non-government organization. Another tool used is the self-assessment that gauged the producer's knowledge and skill in pig farming. The interviews of selected chain actors (traders) and supporters (government and cooperative) was conducted to gather data that described the current situation of the pork value chain. Validation of the result of the survey was done through the conducted FGD.

The interviews for the key informant utilized a semi-structured interview. The interviews were conducted through online platform (Zoom and Messenger applications). There are a total of eleven interviews, with supporters being represented by Cooperatives (Tanauan Hog Raisers Cooperative, Soro-soro Ibaba Development Cooperative and Sabang-Ibaan Multi-Purpose Cooperative) and the government (DA NLP and ITCPH).

Respondents or the interviewee for the "Interview of key informants", was selected based on their involvement with the livestock extension programs. The interviewees that are selected have work with the pig farmers or implemented a program with the Local Government Unit and National Livestock or with Agricultural Training Institute. The interviewees are representative from: Department of Agriculture – National Livestock Program, ATI-International Training Center on Pig Husbandry, and Agricultural Extension Workers, Local government unit. Cooperatives providing services for the pig producers are also interviewed. The focus of the interview were the services and support provided to the stakeholders as well as the opportunities and challenges of the chain actor according to their perspective.

Figure 6. Research Framework



Source: Author, 2021

Table 3. Research Strategy

RESEARCH QUESTIONS	Data to be Gathered	Method	Source/Respondents	Methods of Selection / Sampling Method
1.What is the current situation of the pork sector in the Philippines?				
1.1. What is the production performance of the pork sector?	Production Targets compared to production performance	Desk Study	Swine Industry Performance Report (DOST PCCARRD Annual Report, 2019)	
1.2. What are the factors that affect productivity of the pig producers?	Input to Production Aspects of Production Farming Systems Access to Finance Level of Technical Capabilities Constraints	Survey Self-Assessment Checklist	Pig Producers	Purposive  Survey Respondents Criteria: Pig Producers coming from the high producing regions of the country, generally from Region IVA, Region VII and Region X.
1.3. What are the enabling/disabling environment affecting productivity of the pig producers?	Political – Economic  Government Policies and Regulations Opportunities	Survey Focus Group Discussion  Semi-Structured Interview  Desk Study	Pig Producers  Agricultural Extension Workers – Livestock (LGU, ITCPH) National Livestock Program Coordinator Cooperative  Financial Institution (Banks such as Land Bank of the Philippines) Agricultural Credit Policy Council	Fifteen respondents per each region/cluster for the survey
2.What is the governance structure of the pork value chain?				

2.1. Who are the stakeholders (actors and supporters) and their roles?	Pork Value Chain Actors and Supporters Roles of the Stakeholders	Desk Study	Swine Industry Performance Report Hog Industry Roadmap (2018 – 2022) Annual Reports	
2.2. What is the chain relation among the farmers and the immediate actors and supporters?	Chain relations Level of interests and influence	Semi-structured Interview  Focus Group Discussion	Pig Producers' Group/Cooperative Representative Traders	
2.3. What are the market channels and infrastructure available for the pig producers?	Market Channels Transporting / Transfer of pork product from the producer to the immediate market  Market environment	Desk Study	Department of Trade and Industry Department of Agriculture Memorandum and Releases	

*Source: Author, 2021*

### **3.3. Data Collection**

#### **3.3.1. Desk Study**

Desk study is the collation of gathered information from various sources that enables the researcher to further understand the related topics and areas of the research subject. In this research, desk research was employed to gather information and knowledge on the pig sector of the Philippines, the current situation in terms of national productivity, where printed issuances of the Philippine Statistics Authority were utilized. The desk study was also utilized to gather information on the financial institutions programs that are available and accessible to the pig producers. The following secondary sources, through the official websites and publications were used to conduct this study:

- Scholarly publications and articles from websites
- Articles, memorandum and issuances from government agencies such as Department of Agriculture, Department of Trade and Industry and Philippine Statistics Authority
- Publication through websites from financial institution such as Landbank of the Philippines

#### **3.3.2. Survey**

The survey was carried out using a structured questionnaire administered to the pig producers from different region of the country. The total number of respondents were forty-five, equally distributed

among the three-island group, fifteen each group. The survey was done in order to derive the producers' perspective on their production, marketing relations and access to finance and support. A checklist was also administered to the producers to gauge their level of self-assessment with their knowledge and technical skills in pig farming.

### **3.3.3. Semi-structured Interview**

Semi-structured interviews were conducted to the key informants of the chain. The informants are supporters of the chain. These supporters have impact and influences on the pig producers as well as to the activities in the pork value chain. The key informants were selected to capture all the insights of the actors and supporters.

### **3.3.4. Focus Group Discussion**

To further validate and explore the views of the producers, an online focus group discussion was also conducted. The use of messenger application was utilized. The discussion further explores other issues related to the chain, most of the pressing concerns of the producers that were not definite on the survey. To further validate the statements during FGD, a transcription was sent to the respondents and the researcher secured agreement with the respondents regarding the statements given.

## **3.4. Methods of Data Collection and Analysis**

Analysis of data was based on the nature of the data collected. Data gathered with the survey from the pig producers was processed through statistical methods such as descriptive analysis and chi-square test through SPSS. Clustering of data was based on the area where the respondents come from, this is to show whether there is a disparity of the situation and practices of the farmers depending on the geographical area and to gain better perspective on the needs of the pork producers. Categorization was based on the geographical locations according to the three-island group of the country, Luzon, Visayas and Mindanao. This generates whether there was a similarity or difference when it comes to the views of the pig farmers on the different aspects of pig production, the services and support they access based on the geographic locations where they come from as well as the relationship or governance. To analyze the result, data were processed through SPSS software, using cross tabulation and chi-square test (test for ordinal data). This will also generate result on what they perceive that they need in terms of what support or services coming from the government and what they actually need. Descriptive analysis was also done and was presented through graphs and tables.

Data captured from the interview was identified depending on the categories, which was based on the structure of the guide questionnaire. These data were summarized through key points and highlights. Categorization were also done. Agreements and contradictions on the statements on the interview of the key informant (chain actors and supporters) were taken into details. Patterns were also identified through clustering and identifications of agreements, contradictions and gaps on the interviews.

Findings from these data was presented through narratives. Interview results from the key informants was compared to the data generated from the questionnaire(survey) from the pig farmers, particularly with regards to the services accessed and available to the farmers and the programs provided by the agricultural extension workers. FGD and interviews of key informants were transcribed in document format.

Relevant information gathered from the interview of the stakeholder and supporter as well as the desk study was presented through value chain map. An opportunities and constraints summary



through table and PEST were also presented to further illustrate the environment of the pork value chain.

#### **3.4.1. Limitations to Data Collection and Analysis**

This research study was conducted in the midst current situation, in reference to the COVID-19. This situation has hindered field research on the subject country as there are restrictions that are in place. This also affected the ease of conducting research. Doing research during this time could prove to be challenging but also presents opportunity to explore and maximize alternative means of conducting research. This situation could develop a new sense and perspective in doing research.

As this study was conducted remotely from Velp, the Netherlands, enumerated below are the limitations encountered during the research, particularly during data collection.

1. There are instances that attending to clarifications from the respondents was not on “acted on time”. Time difference between here and the subject country posed as a challenge.
2. The sample generated from the purposive sampling reflects only pig producers that have access to reliable internet connection, it may not reflect the general picture of the whole population of pig producers. And those who do not access may have more of the concerns rather than those respondents that are gathered in the research.
3. The COVID-19 pandemic has restricted the movement of people within the subject country. The whole data gathering process were done through online platform. This has restricted interaction with the respondents that could provide an extensive insight on the topic.
4. As the data gathering was done on July to August, internet connectivity was affected by the rainy season. Two typhoons were experienced during the period, thus affecting the respondent’s connectivity.

## CHAPTER IV. RESULTS

This chapter presents the result of the data gathered. Survey and questionnaire results were processed through SPSS software, using descriptive analysis and Chi-square test for ordinal data. Key informants' interviews and the focus group discussion results were presented through narratives of the collected inputs from the respondents.

### 4.1. Productivity

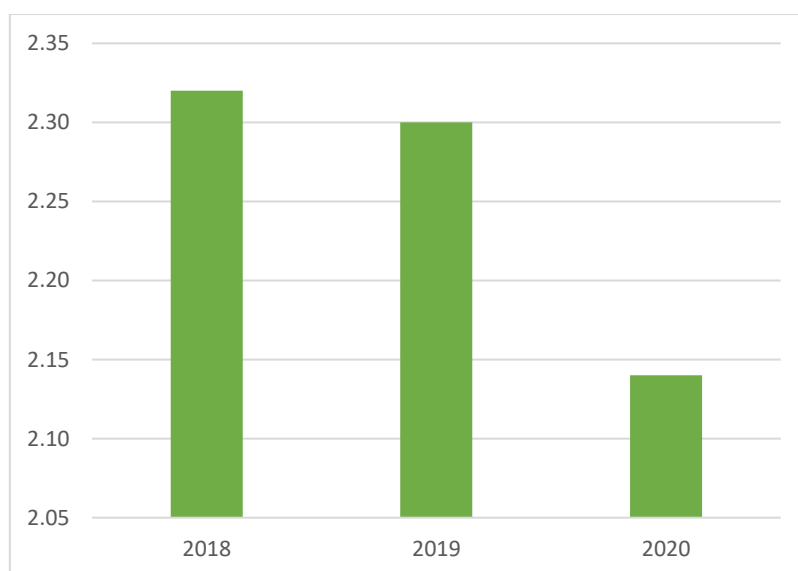
#### 4.1.1. Production Performance

To measure production performance, two parameters were used. These are the volume of production, in national level and the value shares of the actors of the pork value chain.

##### Volume of Production

The total volume of pig production in 2020 was estimated at 2.14 million metric ton, liveweight. Compared to the 2019 production, it was 6.7% lower. The top producing provinces are Batangas, Bulacan and Bukidnon. The three provinces contributed 429,980 metric ton, in liveweight (PSA, 2021).

Figure 7. Volume of Production, 2018-2020



Source: PSA, 2021

The annual average farmgate price for 2020 was at Php 108.71 per kilogram, liveweight. The highest farmgate price that was recorded within the year was on December, a month considered as peak, at Php 126.61 per kilogram, liveweight on the average. It is noted that the liveweight price was at 2.9% higher compare to 2019 (PSA, 2021).

The annual average retail price of pork in the market was recorded at Php 225.15 per kilogram, 4.3% higher compared to 2019. It was noted that the highest recorded price was during December of 2019 at Php 258.43 per kilogram (PSA, 2021).

## Value Shares

Table 4. Value Shares of the Actors of the Pork Value Chain, Philippines

Php per kilogram liveweight; average price per kilogram pork (carcass); € 1 = Php 58.99

Chain Actor	Variable Cost	Revenue (Selling Price)	Gross Income (Revenue – Costs)	Added Value (Revenue – Previous Actor's Revenue)	Gross Margin (Gross Income x 100 / Revenue)	Value Share (Added Value x 100 / Retail Price)
Farmer		108.71		108.71		48%
Trader	139.71	181.46	41.75	72.75	23%	32%
Retailer	188.28	225.15	36.86	43.69	16%	19%

Source: Prices, PSA and BAI, Marketing Division, 2020  
Calculation, Author 2021

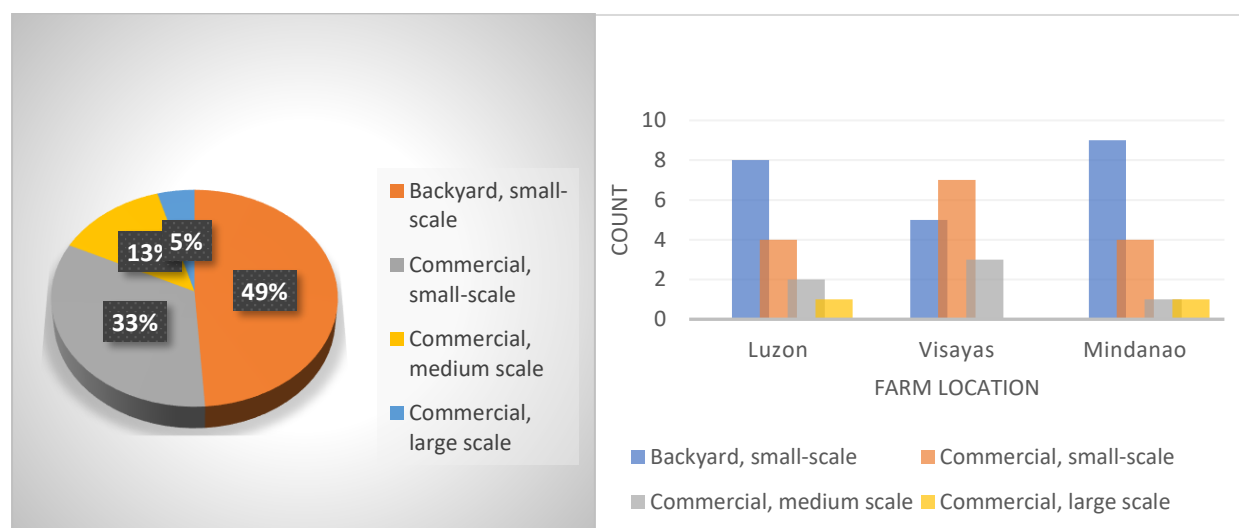
The common practice in bringing the product to the market is from pig producer to buyer or trader to the retailer. The buyer and the trader haul live animals from the farm, bring it to slaughterhouse and commissioned dressing and slaughtering of the animals. In some instances, the trader may also transfer the live animals to another party, thus the transfer of ownership automatically happens.

The variable cost for the pig producer, herein referred as farmer, varies from pig producer to another. The producers are not definite on how much do they spent to produce a kilogram of live animals.

The value share of the pig raisers is estimated to be at forty-eight percent. The trader is at thirty-two percent and the retailer at nineteen percent.

## Farm Classification

Figure 8. Farm Classification



Source: Author, 2021

Forty-nine percent of the respondents classify themselves as backyard raisers, and small scale. For commercial pig producers, thirty-three percent of the total respondents are small scale, while the medium and large scale are thirteen and five percent respectively.

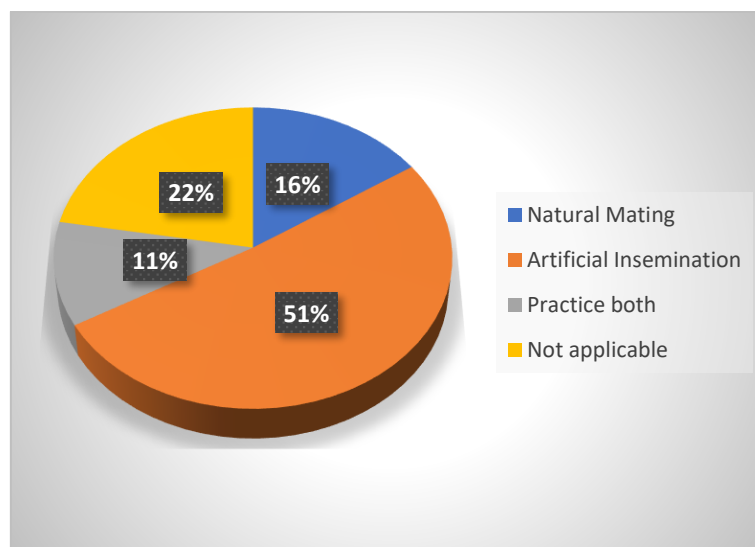
In the distribution, among the respondents, it also reflected that most of the pig producers are classifying themselves as backyard farmers, where they have less than ten sow and no formal registration. The backyard, small scale raisers comprise the majority of the pig raisers as also reflected

in the PSA databases wherein the total pig farms in the Philippines is comprised of around sixty to seventy percent backyard raisers.

#### 4.1.2. Input to Production

##### 4.1.2.1. Aspects of Production

Figure 9. Breeds and Breeding



Source: Author, 2021

Majority of the pig raisers utilizes artificial insemination as their breeding practice, fifty-one percent based on the survey. This is generally the same among the respondents coming from the three-island cluster. Based on the survey result, among the respondents, eleven percent of them owns a boar that they are utilizing for the breeding practice, thus natural/pen mating is being practiced. Two percent of the respondent, also practices natural mating, but does not own a boar and utilizes the available boar service within their area. Forty-two percent of the respondent, practices artificial insemination using own process semen, while eleven percent of them also do artificial insemination but uses semen available from the AI business centers. It was noted also that thirteen percent of the respondents uses combination of any methods mentioned.

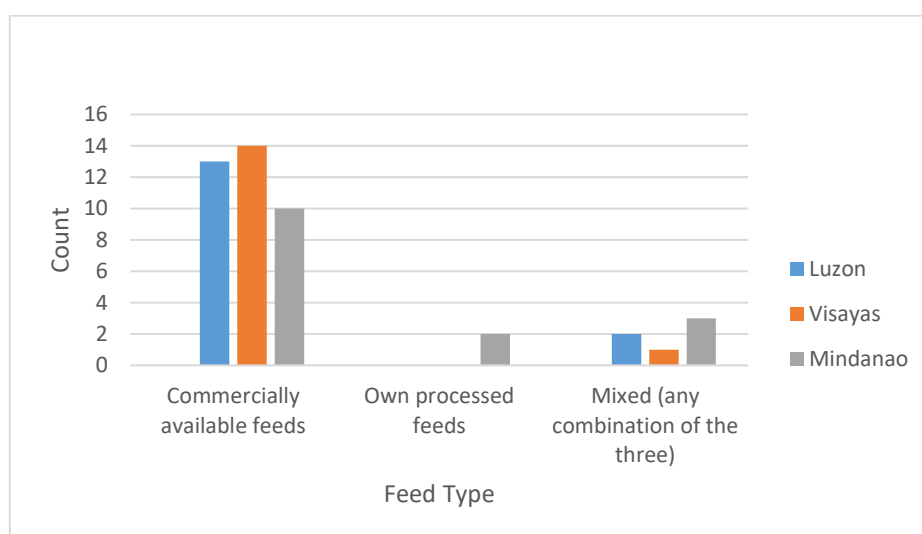
Table 5. Type of Breeds Used as Breeders

Breeds	Percentage
Pure Breed	17.8
Cross Breed	33.3
Hybrid	22.2
No Information Available	26.7
Total	100

Source: Author, 2021

Thirty-three percent of the respondents, representing majority, uses cross breed as their breeders. Cross breeds are combination of two breeds with the purpose of getting the genetic advantage of both parent stock.

Figure 10. Feeds and Nutrition



Source: Author, 2021

The pig producers utilized the readily available commercial feeds on their production. The main reason for using this type of feeds is their personal preference with the availability and accessibility also being considered. Pig producers acquire this input through feed mills of cooperative, as well as from the feed retailers. Those with large production, in the case of commercial, medium and large scale, they are able to procure their feeds from private company feed mills.

Pig producers are also aware of the nutritional value of feeds. Majority of the respondents, at 90% are aware of the nutritional benefits and the impact of nutrition to production. Majority of them also uses proper feeding method such as the feeding scheme and scheduling of the shifting of feeds based on the age and the production parameters.

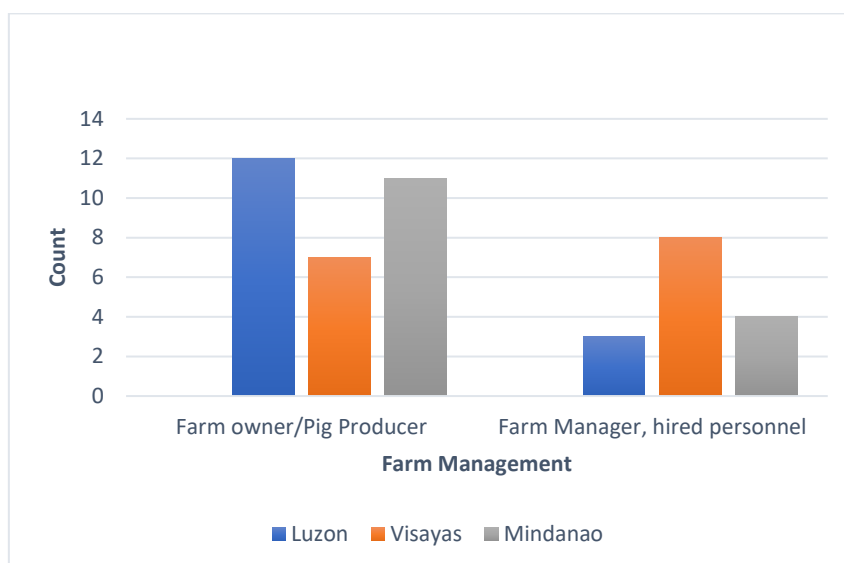
Table 6. Consideration on Choosing Feed Type

Consideration	Percentage
Availability and accessibility	44
Cost	16
Personal Preference	40
Total	100

Source: Author, 2021

The respondents consider the availability and accessibility as the main reason for using the commercially available feeds. It is also evident that the personal preferences of the pig producer also play part in deciding the type of feeds to be used in production.

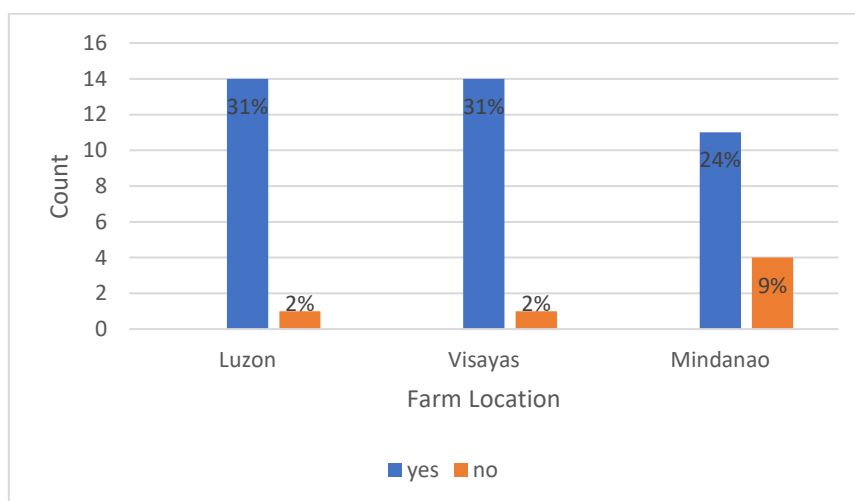
Figure 11. Farm Administration and Management



Source: Author, 2021

Majority of the pig farms are managed by the owner or the pig producers themselves. Sixty-six percent of the respondents are the owner of the farm who manages it. On the other hand, thirty-three percent of the respondents have hired farm manager and personnel that manages the farm. Of which also, the decision making was mainly dependent also to the owner, which among the respondents, seventy-five percent.

Table 7. Farm Health and Vaccination Program

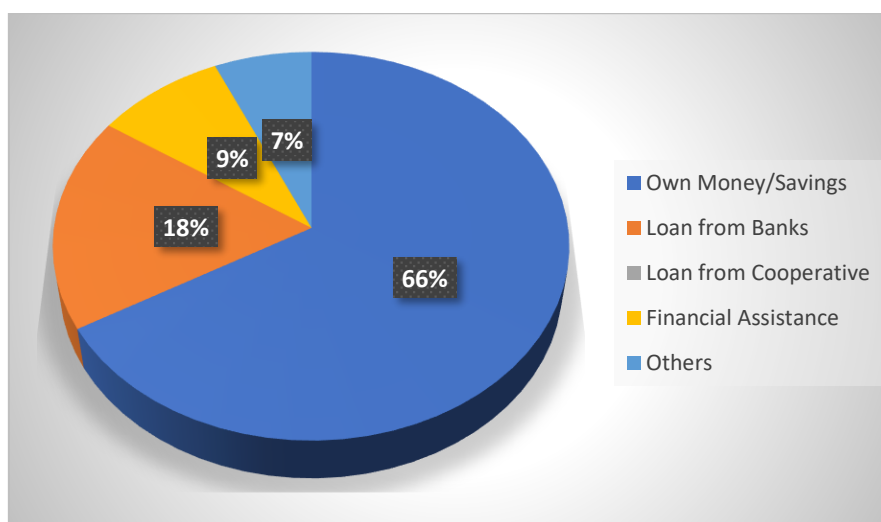


Source: Author, 2021

The pig producers adopt a health and vaccination program for their farms. Eighty-six percent of the respondent have health and vaccination programs implemented. The remaining thirteen percent of the respondents who does not have health and vaccination program states that there is no need for such due to non-prevalence of disease in their area and it is their management prerogative to do such. Another reason raised was that the pig producer does not have enough training and knowledge in implementing vaccination and health programs.

#### 4.1.2.2. Access to Finance

Figure 12. Financial Source



Source: Author, 2021

Majority of the respondents, which is sixty-six percent, started and financed their pig raising business through own money. According to the result of the survey, sixty-seven percent of the respondent did not acquire a loan from any financial institution. The main reason of the not acquiring a loan from any financial institution is due to the too much documentation requirements and it takes longer time in securing a loan. The required documents, from being a registered farm, financial documents and documents that could guarantee their capacity to pay the loan proves to be tedious to do for small scale pig producers, as reflected in the focus group discussion. When it comes to government assistance and grants, the requirements were also cited as the main reason for not continuing to secure any grants and assistance with the government.

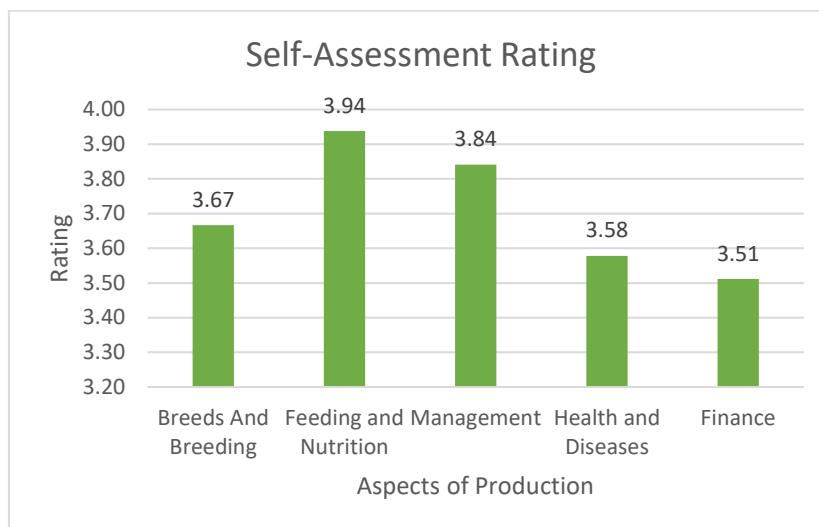
The government provides various grants and assistance to pig producers. The loans and programs are being facilitated by the Department of Agriculture, with government banks such as Land Bank of the Philippines, as the banking intermediaries. These programs ranged from assistance for repopulation and expansion to loans amounting to as much as three million pesos, under the SWINE R3, SWINE Lending Program (Special Window and Interim Support to Nurture Hog Enterprises) and INSPIRE program launched this year by the current administration.

The pig producers that were able to secure a loan from the bank, as represented by eighteen percent of the respondents have complete documents prior to securing a loan. They have complete records of the farm that made it possible for them to avail the loan. As claimed by the pig producers during the focus group discussion, most of the affected pig producers want to avail the programs launched by the government and they have also learned about it. With the two respondents of the FGD, even they qualified with the programs they are still not able to benefit from it. They are not able to access it due to lack of communication with them since they claimed that they only heard about it but no one from the government has offered it to them.

#### 4.1.2.3. Knowledge and Technical Skills

Knowledge and technical skills play a role on engaging to any business and social activity. Sufficient knowledge manifests a difference on how one farmer produces over the other farmers lacking the knowledge and skills. The graph shows how the respondent pig producers rate their capacities in terms of their knowledge and technical skills.

Figure 13. Self-Assessment Rating on Knowledge and Skills



*Source: Author, 2021*

Based on the self-assessment checklist, the average rating that the pig producers rate themselves are as follows: Breeds and Breeding, 3.67; Feeding and Nutrition, 3.94; Management, 3.84; Health and Diseases, 3.58 and Finance, 3.51. The rating scale used is 1 to 5, the latter being the highest score.

By looking at the assessment done by the pig producers with their knowledge and skills on the area enumerated, their rating is translated as they have average knowledge and skills on the aspects of production. The scale used was one to five, with five as the highest rating. This rating scale was translated as one being poor, three as average and five as excellent. It can be noted that the pig producers are not very confident on their knowledge and skills.

Accordingly, on the survey conducted, there are respondents who are not utilizing introduced technologies on pig production. It is cited that two percent of the respondent of the respondents are not utilizing artificial insemination for the reason that they do not have access and knowledge to it. As to the type of breeds that are being used, twenty-six percent of the respondents does not also know or do not have information about the breeds that they are using. This manifest the limited knowledge that they have since they could not determine the type of breed that they are rearing. On the survey, it also reflected that thirteen percent of the respondents does not have vaccination program where cited reason, aside from management decision, is that they do not have enough training and knowledge to implement vaccination and health programs.

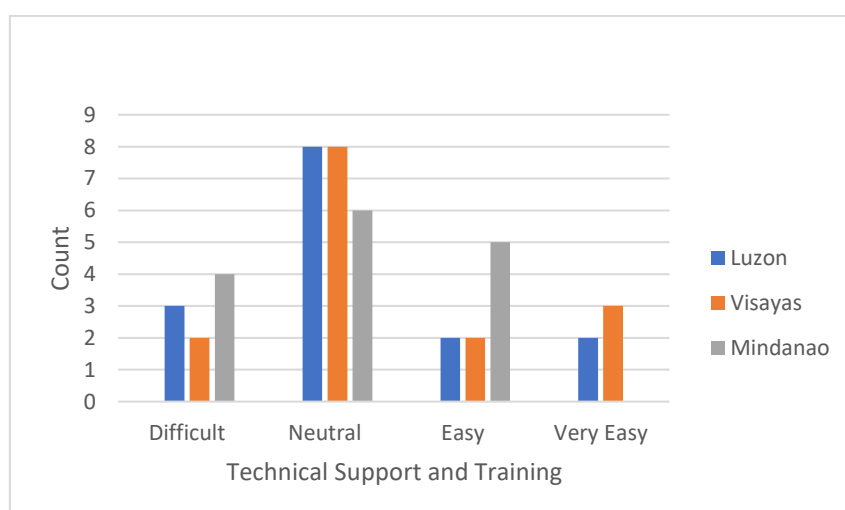
It is also evident that on area of access to finance, the pig producers have limited knowledge when it comes to financial documentation and records. As reflected during focus group discussion and on the survey as well, thirty-four percent of the respondents are using own money to finance the operation and only thirty-four percent were able to access loans from financial institutions and cooperative. The cited reason for non-availment of the majority is the documentation requirements such as financial statements, business registrations and other compliance certificate. The pig producers does not have formal records and also have limited knowledge on proper record keeping and financial records as well.



Through the different interviews with the agricultural extension workers in different provinces the following are their observations with regards to the knowledge and technical skills of the pig producers in their areas.

- Pig producers still needs to be capacitated in terms on knowledge on breeds and how they can take advantage of upgrading and selecting the appropriate breed for production.
- Among the two categories of swine raising, the backyard is more at risk than the commercial one because of the lack of implementation of biosecurity measures. Some of the practices of producing swine in backyard farms are still conventional. Before the issuance of the local ordinance and executive orders of the province against ASF in which swill feeding is prohibited, backyard farms are commonly practicing it.
- Proper administration and use of artificial insemination.
- Since most of the pig producers, even small-scale raisers are using commercial feeds, it is beneficial for them to be informed of the different nutrients and at which age or group of animals it should be fed. To summarize, it is more on the feeding management.
- Bio-security should also be taken into consideration, to equip them in case another disease becomes of concern.
- Financial management and trading relations.
- To improve their production, it would have been better if all pig producers have records and are obliged to submit their farm performance for the extension workers to have a true picture of the swine industry even at the backyard level. In this way, everything will be addressed accordingly.
- Market practices or a sure market channel is an important part of the pig production. Linkage and access to a stable market would be beneficial to the pig producers.

Figure 14. Access of Pig Producers to Technical Support and Training



Source: Author, 2021

Majority of the respondents find the ease to access to technical support and training to be neutral. Comparably, more respondents from Luzon area finds it difficult to access as compared to the other respondent, six percent of the respondents.

The data gathered reflect that among the respondents coming from the three-island group, that there is no difference with the ease of access to technical support and training. The probability observed

from the sample,  $p=.442$ , which is greater than 0.05. It is also observed that the expected count exceeded, which is six (Annex 6).

As mentioned by the respondents of the focused group discussion, they were able to access technical support and training provided by the government, specifically ITCPH. The respondents are alumni of the center and have attended several trainings and seminars.

#### 4.1.3. Political-Economic Environment

There are regulations imposed by the government on pig raising in the Philippines. The level of securing and adhering to these requirements is dependent also the location where the farm is. There are provinces where requirement is less than the other. In general, the basic requirements are as follows:

Table 8. Basic Requirement for Setting up Pig Farm

Basic Requirement	Description
Business Requirements <ul style="list-style-type: none"> <li>• Business Name Registration – Department of Trade and Industry (DTI)</li> <li>• Barangay Clearance</li> <li>• Mayor's Permit, License, and Sanitary permit</li> <li>• Tax Identification Number (TIN)</li> <li>• Environmental Compliance Certificate Department of Environment and Natural Resources (DENR)</li> </ul>	<p>As required by law, registering a pig farm as a business is necessary. A business name is registered with the Department of Trade and Industry. Said farm has to be registered also to the local government unit, from Barangay level to the municipal level. For taxation purpose, the owner has to secure also TIN.</p> <p>Environmental Compliance Certificate (ECC), is an added certification which provide proof that the farm adheres to the proper waste management, and does not affect the environment. This is usually secured after the farm has presented its waste management facility depending on the requirement of the locality where the farm is located.</p>
Zoning (Area Categorization)	<p>A farm cannot operate in an area categorized as "urban" and "commercial". There is exception such as if the farm was established prior to the new categorization or transition of classification, from agricultural to commercial.</p> <p>The farm must be located outside the proximity of the urban areas.</p> <p>It must not be located within the 25 km radius of the source of potable water.</p> <p>Medium and large-scale pig farm must be located at least 1,000 meters away from residential, industrial, institutional, and commercial areas.</p>
Good Animal Husbandry Practices <ul style="list-style-type: none"> <li>• Republic Act 8485, Animal Welfare Act, 1998</li> <li>• Republic Act 10631, Amended Animal Welfare Act of 2013</li> </ul>	<p>The general principles of good practice and minimum requirements in breeding, commercial and backyard rearing/farming of swine for breeding and food use.</p>

Source: DTI and DENR, Author, 2021

There are various programs of the government that are devised to aid the pig producers toward productivity.

In terms of financial, there are loans and grants provided by the government through the financial institution such as banks. Based on the publications of Landbank of the Philippines, there are ten financing programs that are offered to the farmers and fisherfolk. Among these there are five programs that pig producers can avail. These are as follows:

- Agricultural and Fishers Financing Program

The LANDBANK Agricultural and Fisheries Financing Program (AFFP) provides small farmers access to formal credit to finance their economic activities. The AFFP is being implemented in partnership with the Department of Agriculture (DA) and the Agricultural and Credit Policy Council pursuant to the General Appropriations Act of 2013.

This program is for small farmers. Those cultivating not more than five hectares of land and/or are engaged as small poultry/livestock raisers who are defined as those raising not more than the following: for poultry (1,000 poultry layers or 5,000 broilers); swine (10 sow level or 20 fatteners); cattle (10 fatteners or 5 breeders); dairy (10 milking cows); and goat (50 heads).

- Agricultural Credit Support Project

The Agricultural Credit Support Project (ACSP) offers loan funds toward increasing investments, creating new job opportunities, and improving agricultural productivity in the rural areas. The ACSP provides credit support to agriculture and Agri-related projects within a value chain.

- Agricultural Competitiveness Enhancement Fund

The ACEF Lending Program aims to provide necessary credit to farmers and fisherfolk and their cooperatives and associations and micro and small enterprises to increase their productivity; and to establish an agricultural lending program that enhances competitiveness of target project beneficiaries or sectors especially the small farmers and fisherfolk.

- SWINE Lending Program

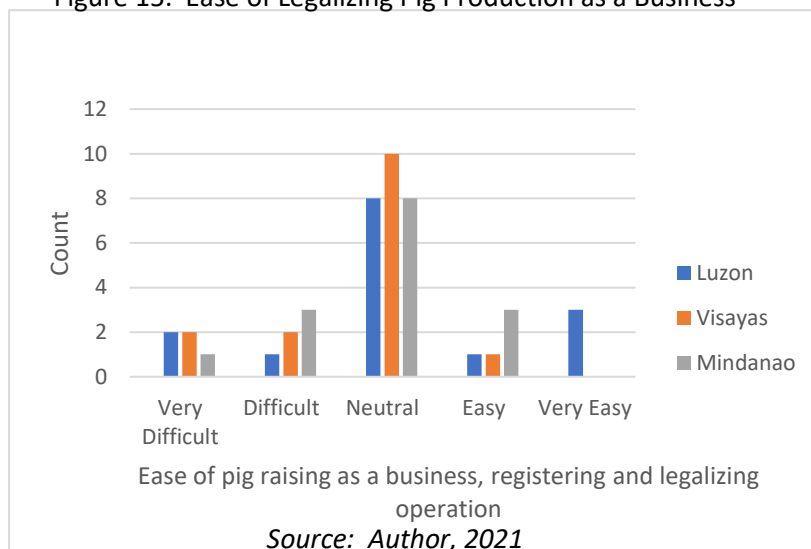
The SWINE Lending Program aims to provide financing support to the swine industry to help secure the country's food security, particularly on the supply of pork.

The Department of Agriculture through the National Livestock Program has augmented the desire to empower the livestock sector through programs in the midst of ASF. According to the National Livestock Program Director, there are various programs that are now currently implemented. To name some of the prominent program to date, these are: Al sa Barangay; Hog Repopulation "Bantay ASF sa Barangay"; Bayanihan Act II; INSPIRE or the Integrated National Swine Production Initiatives for Recovery and Expansion and the Swine R3 (Repopulation, Rehabilitation and Recovery Credit Program).

"Al sa Barangay" program aims to upgrade the genetic resources to small hold farmers by providing the farmers readily available processed semen on different areas "barangay" of the country. Under the Bayanihan Act II, which was spearheaded by the current administration, a Swine Multiplier and Techno Demo Farms are being funded. Said program aims to produce quality breeders for local raisers in order to improve the genetic lines of the pigs. The program is establishing swine multiplier farms in several areas at: ITCPH swine nucleus and techno-demo farm in Lipa City; LGU San Teodoro in Oriental Mindoro; Zamboanga City Hog and Poultry Raisers' Association; and Soro-soro Ibaba

Development Cooperative; other partner-LGUs; state universities and colleges (SUCs); and farmers' cooperatives and associations (FCAs). Other programs are in line with the repopulation that is timely in addressing the losses that were experienced due to ASF. These programs infused funds to fuel production of the local raisers.

Figure 15. Ease of Legalizing Pig Production as a Business



Results from the respondents showed that significance,  $p$  value = 0.317, which is greater than 0.05. Expected count also exceeded,  $df=8$  (expected count > 5, Annex 6). To conclude, there is no difference in the ease of legalizing the business whether it comes from any of the island cluster.

It is noted that respondents, from all the cluster, shows that the ease of legalizing the pig production as a business is at neutral, it is neither difficult nor easy.

### PEST Analysis (Political, Economic, Social and Technological Analysis)

Table 9. PEST Analysis

Political	Economic	Social	Technological
<ul style="list-style-type: none"> <li>Availability of government initiative for financial and technological support and mechanisms</li> <li>Implementation of increased allowable import for processed and frozen pork</li> <li>Government policies and regulations on environment and zoning</li> <li>1-3-10 policy</li> </ul>	<ul style="list-style-type: none"> <li>Financial institutions providing loans and subsidies</li> <li>Unstable market price for liveweight</li> <li>Stable input supply</li> <li>Demand for locally produced pork is high</li> <li>Price sensitivity of household consumers</li> <li>Partial market oriented</li> </ul>	<ul style="list-style-type: none"> <li>Consumer preference for locally produced pork</li> <li>Environmental awareness on effects of animal production</li> <li>Growing interest of a niche market to healthy options</li> </ul>	<ul style="list-style-type: none"> <li>Upgrade on pig production technologies</li> <li>Implementation of RFID and tagging system to monitor livestock</li> <li>Connectivity and online services and consultations</li> </ul>

Source: Author, 2021

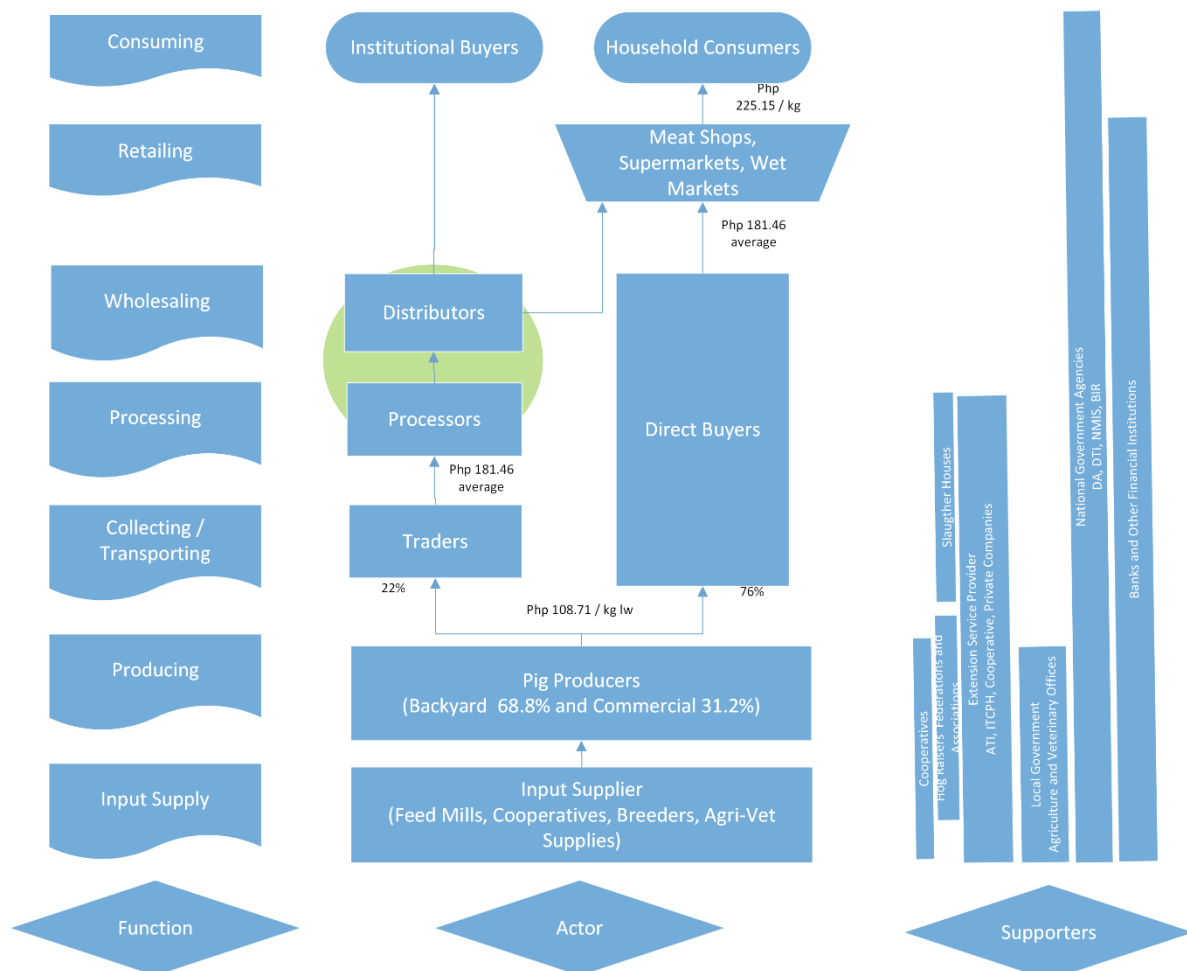
The PEST analysis was the data gathered through the interviews and focus group discussion. The political issues evolving in the pork value chain is mainly administrative and legality of the pig venture. It also included the areas on environment protection and preservation that is implemented on the country. Economic, as noted from the interviews, evolved on the pricing of the commodity and the sensitivity of the consumers on the increasing price as resulted by the limited supply. It was noted that there is available upgrade on pig production technologies that were being provided through trainings. These trainings were currently made available to the pig producers and extension workers through online modalities. This poses a constraint since not all pig producers have access to reliable internet connectivity.

## 4.2. Value Chain Governance (Typology and Structure)

### 4.2.1. Value Chain Stakeholders

The pork value chain of the Philippines is relatively similar in any part of the country. Stakeholders are composed of the actors and supporters.

Figure 16. Pork Value Chain, Philippines  
Pig Producers (Backyard and Commercial)

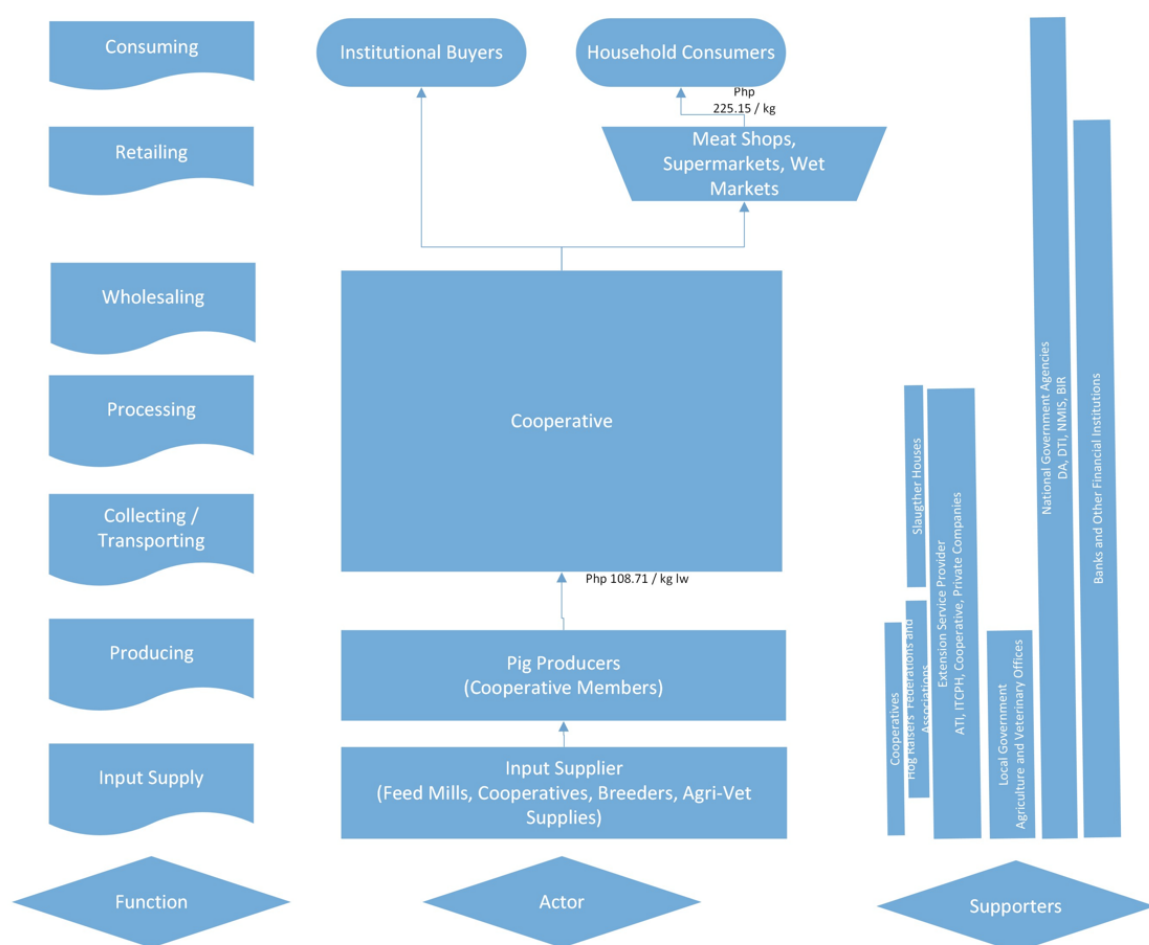


Source: Author, 2021

The pork value chain of the Philippines is composed mainly of the backyard pig producers, contributing to sixty-eight percent of the total registered pig farms in the country. The number might be even bigger since not all pig producers are registered with either the local government or the Department of Agriculture.

Another classification of the pig producers is that they may be a member of a pig raisers cooperative. The members of the cooperative have another option in marketing their produce, as illustrated in Figure 17, which is through the cooperative.

Figure 17. Pork Value Chain, Philippines  
Pig Producers (Cooperative)



Source: Author, 2021

The value chains were drawn according to the discussions that the researcher have with the producers, cooperative representative and traders. A personal knowledge and experience also contributed to the visualization of the value chain. According to the pig producers, they usually sell to the direct buyers who come to the farm. There are also traders that visits their area and look for pigs to be bought. The direct buyers usually have their own meat shops where they market the carcass, while the traders have their own clients where they pass on the hauled animals. As for

cooperative members, pig producers, their cooperative helps in marketing the members' produce. One of the interviewed cooperatives has a marketing function. The cooperative has clients where they supplied to and they also have their own meat shop that they sell pork meat to consumers.

As for the input suppliers, the cooperative also helps in securing inputs for their members. One the cooperative mentioned that they even bridge in provision of technical assistance and skills such as training from the government and NGOs to their members. They also provide their pig producers access to financial assistance.

### Actors

The following are the chain actors of the pork value chain:

Table 10. Stakeholder Analysis (Actors)

Actors	Description/Function
Input Supply: Feed Milling Company Breeders Agri-Veterinary Suppliers/Shops	Provides input supply to the pig producers such as feeds, biologics, machineries, tools and equipment.
Cooperatives	Provides input such as breeders, feeds and technical support to members.
Equipment and Machinery Supplier	Provides technical training as well, in line of using new technology and machines for pig raising.
Producers: Small scale, Backyard Raisers	Pig producers with less than 10 sows, no extensive business registration
Small scale, Commercial Raisers	Pig producers with less than 100 sows, uses commercial feeds, with business registration.
Medium scale, Commercial Raisers	Pig producers with 100 to 300 sows, business permits, and specialized farm structures.
Large scale, Commercial Raisers	Pig producers with more than 300 sows, own boars and breeders, and implement artificial insemination (AI). Operates own feed mills, keep computerized farm records, have business permits, and usually have a water treatment facility for the farm.
Direct Buyers	Buyers/purchasers that directly buys live animals from the pig producers. Usually, commissioned slaughterhouse to do slaughtering. They distribute carcasses to client meat shops or they also at times own their own meat shops and sell the meat to consumers.
Traders	Buyers/purchasers that contracts and buys live animals from the pig producers. They have their own clients to which they contract for the live animals.

	Locally known as “Byahero”. Acts as middlemen.
Cooperative (Marketing/Trading)	Cooperatives that act as marketer or “trader” for the members. Functions as a cooperative but also do the marketing of the animals produced.
Processors	Processed carcass into value added products.
Wholesalers	Purchase carcass from the traders, per batch. At time, they also purchase live animals from the traders.
Retailers Meat Shops, Supermarkets, Wet market	Sells the pork at retail to the consumers.
Consumers	Customers, consumes the final product

*Source: Author, 2021*

### **Supporters**

The following are the supporters of the pork value chain.

Table 11. Stakeholder Analysis (Supporters)

Supporters	Functions
Cooperative	Autonomous association of people, having the same interest and goal.
Hog Raiser Cooperative	The hog raiser cooperative has various functions: provision of input, technical and managerial assistance, marketing functions and other related business functions.
Marketing Cooperative	The marketing cooperative has one distinct function as compared with the regular “multi-purpose cooperatives” This cooperative takes active part in selling and connecting the members to ready market. At times, they also facilitate the retailing of the produce of the pig producers.
Local and National Hog Producers Associations	Monitors national legislations which may affect the interests of the numerous, multi-faceted players in the industry.  An avenue where vital statistics on growth performances, market trends, disease incidence and government directions towards protecting the local Agri sectors are discussed and shared for optimum benefit of the Filipino people. Prices and volume movements of ingredients are also included.
Local Government Unit – Agriculture and Veterinary Offices	Monitors the activities of the farmers. Provides extension service and technical support.
National Government Agencies	Regulates the sector through legislations, rules and laws.
Department of Agriculture Bureau of Animal Industry	Provide extension service and technical support.



Agricultural Training Institute International Training Center on Pig Husbandry National Meat Inspection Services Department of Trade and Industry	Provides aids and enhances the operation of the agriculture sector. Protects consumer rights.
Financial Institutions/Banks Landbank of the Philippines Other Private and Commercial Banks	Provision of financial means for the pig producers. Acts as conduits for the government projects.
Government Accredited Slaughterhouses	Post-harvest processing

*Source: Author, 2021*

### **Opportunities and Challenges of the Pork Value Chain**

The following were the opportunities and challenges determined through the survey, focus group discussions and interviews conducted:

Table 12. Opportunities and Challenges

<b>Opportunities</b>	<b>Challenges and Constraints</b>
<ol style="list-style-type: none"> <li>1. Availability of input supplier</li> <li>2. Partnership from government and other private institutions and organizations</li> <li>3. Local market</li> <li>4. International Market</li> <li>5. Availability of programs of the government, both financial and technical support, for the pig producers</li> </ol>	<ol style="list-style-type: none"> <li>1. Disease occurrences, particularly ASF</li> <li>2. Emergence of new disease</li> <li>3. Entry of imported goods through trade liberalization</li> <li>4. Reclassification and zoning of areas previously designated as agricultural zones to urban areas</li> <li>5. New movement restrictions due to COVID 19 pandemic</li> <li>6. Relationship gap between pig producers and traders</li> <li>7. Government policies, seen as hindrance by pig producers, rather than safeguard for their interests</li> <li>8. Mobilization of produce from southern provinces to the bigger market (like Metro Manila and Southern Luzon)</li> </ol>

*Source: Author, 2021*

#### **4.2.2. Chain Relations**

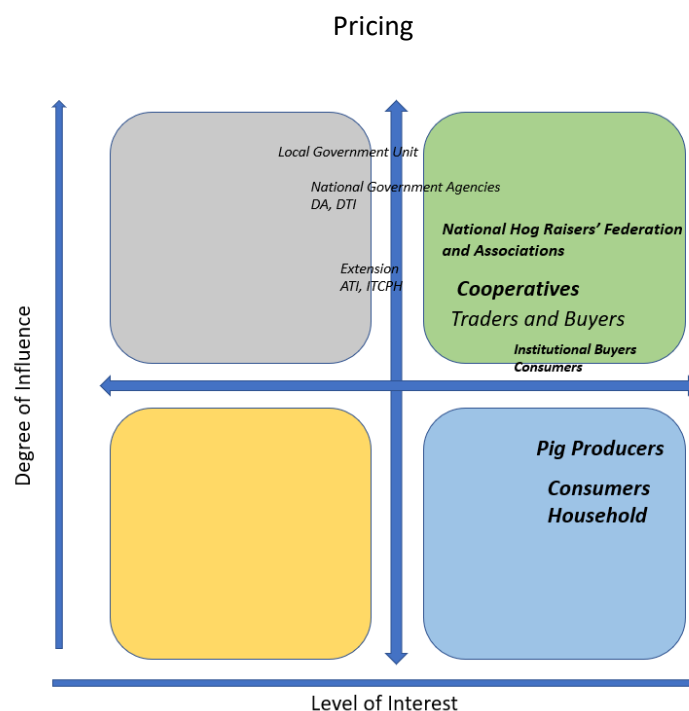
There is no definite or unanimous lead firm within the pork value chain in the country. Cooperatives, in terms of the marketing cooperative, lead the pig producers within its area and members. But the setting is not in general with all the pig producers throughout the country. Based on the focus group discussion, in Visayas cluster, the most common among the respondents is that they have either a direct buyer, which also commissioned the slaughtering and sells the carcass, and a trader, who conducts their business through buying from a producer then sells it to their clients. This is also evident with the Mindanao cluster, where majority of the producers sell their produce to a direct buyer. Cooperative only works best in areas where they are actively influencing members towards engagement to pig production.

During focus group discussion, the participants all agreed that pricing and standards are all influenced by the buyers, with consideration with the prevailing or published prices by the national federations and associations. Unlike, pork and meat products, live animals have no limit price in place (ceiling and floor prices). "Price Act", as mandated by laws in the Philippines covers only the issuance of a

“suggested retail price” or SRP to any or all basic necessities and prime commodities under its jurisdiction for the information and guidance of producers, retailers, and consumers. It covers all Agri-fishery products that are being sold to the consumers. The approval of the Executive Order 124, last February 1, 2021, imposed a price ceiling of pork and chicken products in the National Capital Region, according to the discussion, its effect to the producers were not generally felt as they are still subjected on the prevailing price of the liveweight and to what the traders and buyers are offering. It was also raised during the focus group discussion, specifically in Mindanao cluster that government programs like importation have an impact with the price on their end. As the government tries to address the shortage of meat products in Luzon area through importation, it has a negative effect on them due to the competition that it posed on the market.

Despite of the various programs of the government for the repopulation and rebuilding of the pork industry affected by the ASF, respondents on the focus group discussion on Luzon cluster noted that they have not yet availed any of the programs. They have knowledge and information regarding the programs but the actual program has not yet reached them. Two of the respondents of the focus group discussion were affected by the disease, and their herd were subjected to depopulation, resulting to losses of around one to three million pesos (€ 18,000 to € 55,000, estimated value). Information flow regarding these programs were relayed through public consultations and meetings. Other pertinent information coming from the government agencies were usually relayed through these methods, as well as publications.

Figure 18. Power – Interest Matrix



Source: Author, 2021

As reflected on the data gathered, majority or seventy percent of them sells their produce to direct buyers. Accordingly, thirty-seven percent of the respondents indicated that pricing is dependent on the traders and buyers, while thirty-three percent of them indicates that it is the producer who takes the initiative in pricing. The influence of the buyers and traders to the pricing is depicted in the responses. They also shown a high level of interest. In the interview with the trader, they have shown

that they are also dependent, their business, to the producer for most of this trader deals with pork meat alone as their commodity.

#### 4.2.2.1. Type of Chain Governance

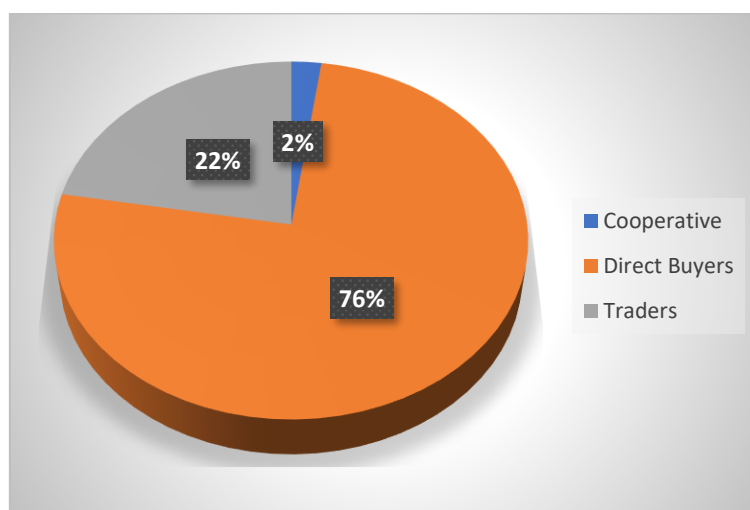
The market type of the pork chain, in input supply perspective, majority of the producers purchase their feeds and biologics to agri-vet supplies, for the small-scale raisers. They do not have any contract with them and the sale is on cash basis. For the cooperative members, or the producers who belong to the cooperative, they tend to buy the feeds with the cooperative who have feed mills. They can get rebates and discounts from the transaction and if they have good member status, the cooperative could give them feeds on accounts, to be paid in an agreed term.

On the majority of small-scale raisers, there are no formal agreements and contracts regarding purchase of the input supplies. This is also same as to the way that pig raisers sell their produce. They do not have formal contracts with the traders and buyers, and the relationship mainly depends on trust gained through the repeated sale transaction. The pig raisers do not have a fixed contract from buyers and traders, and the latter may or may not buy the produce solely depending on his decision. On the other side of this, the buyers and traders do not have an assurance as well, whether they can buy or not when they go the farms to buy. There is no formal or written agreement between the traders, buyers and the pig raisers.

The information flows from the buyers and traders to the pig producers. As the buyers purchase or look for the animals to buy, they relay to the producers the specifications of what they would like to purchase. This specification usually denotes the weight and the age as most important, and at times, buyers are also interested on the breeds that are used to produce the animals. The price becomes the determining factor whether the pig producers would sell and the traders/buyers would buy. The liveweight price can be noted as not stable, as it is also affected by the releases of the government and the decision of the buyer.

#### 4.2.3. Market Channel and Infrastructure

Figure 19. Market Channel of Pig Producers



Source: Author, 2021

Among the respondents, the most common method of selling their produce is through direct buyers. Based on the focus group discussion, these direct buyers have either their own meat shops that they sell into the meat after slaughter or have ready clients where they distribute the carcass once it is

slaughtered. As for the traders, there are twenty-two percent among them that sell to the traders. Only two percent of the respondents go through their own cooperative, to sell the produce.

Based on an interview conducted to one of the cooperative operating within the Luzon area, their cooperative takes charge on marketing their members' produce. This cooperative was established to answer the need of the producers to sell their produce at a price they deemed appropriate. According to them, the cooperative saw a big potential of giving more opportunity to the producers rather than the usual producer-trader set up. They established the cooperative with this aim and they are currently marketing their members' produce through their own meat shops and retail clients.

Based on the focus group discussion, it is noted that one of the current concerns of the pig producers in Mindanao cluster is the access to market. They are able to produce pigs based on prescribed standards and quality but they are relaying to direct buyers and traders only. These traders, according to them, exercise more influence over the pricing and volume of purchase. The majority of the pig producers in the area does not have the capacity to market their produce to the bigger market due to the constraints in processing such as availability of slaughterhouses, and the means of transporting, either live animals or carcass.

In one of the provinces of Mindanao, according to the Extension Officer that was interviewed, commercial swine raisers often sold their produce outside the province. They usually delivered it to Metro Manila, Visayas, and nearby provinces like Zamboanga del Sur and Zamboanga del Norte. On the other hand, the backyard swine raisers commonly sold their produce to the local market. In terms of their ways of selling their product, most of the producers usually sell it as live pigs to local meat dealers and "viajeros". However, some producers especially those organized producers slaughtered their produce and sell it as raw meat in their own meat shops and some also processed it as longganisa, tocino, and chorizo.

It is observed that the methods of selling the produce, across the three-island group is similar. The pig producers mostly accessed the direct buyer and traders as their immediate market. The cooperative also takes part but for their members only, that during the research only covers two percent of the respondents.

## **CHAPTER V. DISCUSSION**

The pork sector of the Philippines is currently under a challenging situation. The availability of locally produced meat is being hampered by the effect of the current prevailing disease. Pig producers are directly affected as their means on livelihood depends on the production. It is never a question of whether there is a demand for the locally produced as pork meat is the most widely consumed meat in the country. The supply is currently stabilizing but more as a result of the availability of more imported meat in the market where in the eyes of the pig producers is a threat to their livelihood.

### **5.1. Productivity**

In general, productivity is the result of the ratio of the input volume and the output volume. It is measured by the total production in comparable to the inputs to production. The input to production does not only count the raw materials needed to produce but also the knowledge and technical skills needed.

#### **5.1.1. Production Performance**

It is found in this research that the total production was on the decline since 2019, from 2.3 million metric ton to 2.14 million metric ton in 2020. This is mainly attributable to the onset of ASF, which resulted to culling and depopulation of herd. It mainly affected farms in the Luzon Island, shifting the volume of production to other regions of the country. In previous years, the Central Luzon was the major producer of pig as well as the Southern Luzon, but currently it has shifted to the other regions of the country, particularly in Visayas and Mindanao. Accordingly, the pig producers that are affected by ASF outbreak came from the Luzon Island, particularly in Central and Southern Luzon.

The small-scale, backyard raisers dominate the majority of the pig farms as classified. Among the respondents, forty-nine percent are backyard raisers, while the commercial raisers accounts for fifty-one percent. This reflect similarly to the reports and data generated from PSA and BAS (2020), where in the key feature of the Philippine pig industry is the small holder production system. It reflects that around seventy percent of the pig producers in the country classify themselves as small-scale, backyard raisers.

#### **5.1.2. Input to Production**

##### **Aspects of Production**

Aside from looking into the actual production figures, there is also a consideration on how the producers are doing the production. The input to production determines the productivity of the farm. In this research, the aspects of production are taken into consideration. These aspects are: Breeds and Breeding; Feed and Nutrition; Farm Administration and Management and Health and Diseases. Based on the survey conducted, majority of the pig producers are using artificial insemination and breeders that they deemed as appropriate to the production. In breeding practices, artificial insemination is seen as a method in improving genetic resources and quality of the produce. According to Field, 2012, it is also the reason that livestock managers took interest in manipulating reproductive patterns of animals, which in turn could provide them improvement on efficiency and profitability. In this way, it is possible to get outstanding traits of more breeds that would ensure productivity of the breeders. This agrees with the result of this research that reflect that fifty-one percent of the respondents are utilizing artificial insemination. Thirty-three percent of the respondents, representing majority, are using cross breeds with their intentions of getting the genetic advantage from it. This agrees with the reason of the livestock managers, as according to Field (2012). Though, in general, not all of the pig producers are utilizing this type of breeding practice. The reason for such depends on the availability of the technical skills and source of the genetic resource such as processed semen within the area. This is also manifested as reproduction is not a stand-alone

procedure, as skills are needed to have a good turn of the practice (Hulsen, 2015). For feeds and nutrition, majority of the farmers use commercially available feeds. This is mainly attributable to their personal preferences and the availability. It is also found out that producers are knowledgeable on the nutritional value of feeds, and they also take this in consideration. Feeds made up to seventy percent of the production cost, and is also of economic importance to the farmers. Aside of economic importance, feeds also support the potential of the breeds. Productivity of the herd is affected if not enough nutrition is provided to the animals. This is in agreement with the animal's need for maintenance, growth and reproduction, according to FAO, 2009, that should be addressed. The farm management and administration, plays an important role in the success of pig production. Majority of the farms are managed by the owner, moreover, decision making was also independent with them. The choice on the practice on waste management and bio security, can be reflected that it was in the discretion of the owner of the farm. Accordingly, profitability of the farm also relies on the management decision over the management. This agrees with what is stated on the ITCPH training manual. Management plays a key role in the profitability. Health programs should be well planned (Field, 2012). This is agreed upon with the respondents who values having health and vaccination programs in the farms. Majority of the pig producers, as reflected in the data gathered, have this program. With the case of the farms who does not have programs, it again relies on the management prerogative not to have to. This aspect of production, aside from the production volume and value share, determines the productivity of the pig producers. The productivity of the pig depends on the breed and the overall management (Dietz, 2011), which in turn gives a farmer more animals to sell. This productivity is associated with the inputs to production.

### **Access to Finance**

Another aspect of production is the access to finance. The financial aspect of pig production is often overlooked. The access of the pig producers in the Philippines is hindered by the documentation requirements as reflected by the respondents during focused group discussion. Majority of the respondents are using their own money, from saving or other income to financed their pig faring business, sixty-six percent as reflected on the survey. The respondents, at sixty-seven percent of them, did not acquire loan from any financial institution citing the difficulty of acquiring such as the reason for not doing so. This validates that access to a comprehensive range of financial services is a significant challenge for smallholders, who constitute the vast majority of farmers in developing countries (IFC, 2014). The situation poses a challenge for farmers to expand their production, and in this case, they started their pig production through using own money instead of securing loans and grants. Despite of the availability of financial programs of the government, the pig producers are still hesitant to avail, as the procedure are seen as tedious for them. The respondents mentioned that the requirements for the government assistance and grants are seen as difficult to comply with.

The requirements for securing a loan range from business registration, full financial declarations and compliance certificates on environment and local legislations. For a small-scale pig raiser, financial records are not easy to comply with. Certifications also proved to be challenging.

The financial programs provided by the government through Land Bank of the Philippines should serve as an access to the pig producers to aid them in their pig production. These programs aim to enhance the economic activities of the small farmers including the pig producers. Out of the ten programs enumerated and published in the official website of LBP, five of the programs can be availed by the pig producers. But despite these programs, most of the respondents have not availed the programs due to the constraints on the requirements and procedures, as mentioned during the focus group discussion and as reflected in the survey. This is also attributable to the limited ability of the pig producers in the financial literacy aspects as well as management and recording. It is also mentioned

that these programs are advertised and made known to the pig producers, but two of the respondents was not reached by the government units. There is a gap between the facilitation of the program and the pig producer who would want to avail the programs. While there are raisers that were able to avail, there are still other “qualified” pig producers who are not able to access the support.

### **Knowledge and Technical Skills**

According to the self-assessment rating result, pig producers are more confident in their knowledge when it comes to feeding and nutrition among the other aspects of production. Feeding and nutrition got the highest rating at 3.94, at the scale with 5 being the highest grade. They least rated themselves on the area of finance at 3.51. According to the interviews conducted with the agricultural extension workers from the provinces, it is noted that they mentioned that pig producers need to be capacitated in areas of breeding and upgrading their production. With the self-assessment rating and the responses on the interview conducted, both reflects the importance of training and capacity building for pig production. Better decisions come up with the proper knowledge that pig raisers could have provided that they have the knowledge and skills. Accordingly, this agrees with the impact on improvement of productivity as a result of training in a study of Malaysian livestock raisers as they become better managers (Noor, 2011).

In comparison to the result of the self-assessment checklist and the interviews conducted in view of the knowledge and technical skills of pig producers and agricultural extension workers. The rating of the pig producers in the different aspects of pig production on an average of three. This denotes that pig producers assessed themselves as neither knowledgeable, or their knowledge and skills at the average. Highest rating that can be acquired is at five, and translated as excellent. In view of this, it was also noted that there are respondents that are not knowledgeable on areas of breeding, health and finance. Comparably, as mentioned by the extension workers interviewed, they deemed it necessary to provide training and support in the aspects of pig production. The pig producers still need to be given trainings on different aspects of production that could result to better yield in production.

#### **5.1.3. Political – Economic Environment**

Doing business in the Philippines, as in this case, a pig raising business is governed by laws and legislation. These laws and legislations facilitate and organize the means of doing the activity. There is business registration that is done in the local government level and in compliance with national regulations, such as republic acts. For the majority of the respondent, they remain neutral towards these legislations, where they find it neither easy nor difficult to comply. It was noted that there was no difference on the response of the pig producers, regardless of the area they are coming from. According to the interviews conducted with the government representatives, there are programs that the government devised in order to prosper productivity and repopulation, as the pig producers were affected by ASF. These programs are seen by the government to fuel the productivity of the pig producers. But according to the respondents of the focus group discussion, they know about the programs but were not able to access the programs. With this, it is seen that there is a gap on how the affected pig producers can access the programs.

The opportunities and constraints presented during the formulation of the Hog Industry Roadmap is related to the current opportunities and constraints that the pig producers are currently facing. The availability of input supplies as provided by the private suppliers as well as the cooperatives facilitates the acquisition of supply for the production. Opportunities such as the partnership for public and private, growing demand, both local and international are still mentioned by the respondents. It is evident that the opportunities encouraged the pig producers to continue production despite the challenges and constraints. It is also evident that despite of the losses due to depopulation, as for ASF

containment, that pig producers are interested to rebuild and continue their pig production. There are similarities on the generated information but with more emphasis on disease occurrence as the main constraint. Disease, ASF, has impacted on the production and supply of the pork value chain. Among the challenges and constraints, respondents focused on disease occurrence, coming in of export due to trade liberalization, the government policies and urbanization. The pig producers think that the policies and zoning are a threat to their pig production.

In general, it was worth noting that the enabling environment of the pig producers in reference to their location, as to the three-island group does not vary. The access to technical support is relatively the same as well. The findings gathered through the statistical result showed that there is no difference on any of the aspects and access of the pig producers throughout the country.

## **5.2. Chain Governance (Typology and Structure)**

### **5.2.1. Value Chain Stakeholders**

The pork value chain of the Philippines is characterized as a typical chain. The actors and supporters of the chain, and its function does not have relevant difference with the other chain of different livestock commodity. The actors of the chain are: input supplier, pig producers, traders, direct buyers, processors, wholesalers, retailers and consumers. The cooperative, can be classified as both an actor and supporter. The cooperative function as an input supplier, where it provides inputs such as breeder, stocks, feeds and biologics to the members. They also take part in marketing the produce, with the transfer of ownership of the live animals to them. It also provides technical support and assistance, and therefore, can be classified as supporter. The role of the cooperative, is very important, in the area where the said cooperative is very active with its members.

The pork value chain, with the pig producers, composed mainly of the backyard raisers. These raisers are vulnerable in different aspects. In terms of the input supply, they are reliant on the accessible and available resources. They are also vulnerable to the influence of the traders in the marketing and selling process. Though they claim that they are also responsible on putting the price for the pigs that they market, said price is also influenced by the published prices by the associations. At the end of the marketing processing, it is still the direct buyer and the traders who decide how many to buy and influence also the price through asking mediation and bargaining with it.

### **5.2.2. Chain Relations**

Price becomes a determinant on whether the producers will sell their produce according to the survey and interview. This determines where they would buy their inputs. This type of chain governance is a market type. This type is characterized by transfer of information on product specification and required quality and quantity is easily transmitted. Products are easily developed and designed with a minimal input from the buyers. This also requires a little or no formal cooperation between actors and stakeholders (Gereffi, et. al, 2005).

According to the pig producers that are interviewed, they also decide on how to put a price on the produce, though, pricing is dependent also to the buyer with the consideration of the published prices by the national federation and association. They use this data to guide them on how they will put a price on their produce. On the part of the buyer and trader, they claimed that they do not have the sole discretion on the price. Cooperatives, on the other hand, markets their members produce. In this situation, there is no uniformity of whether who is the lead firm. Initiatives to lead the activities in the chain is not very evident. Though, it can be considered that in some area where there is an active cooperative, the latter takes the initiative in these aspects. The power and interest matrix reflects the degree of influence and the level of interest of the chain actors. The notion of the pig producers that they have a little or no influence on the pricing denotes that they have a lower degree



of influence. To this extent, as their livelihood is dependent on pig production, this reflect that they have high level of interest to the chain. As the respondent put it, the government through its legislative power and regulations maintains a high degree of influence. The same can be true also to the national hog raisers federations and associations, wherein they influence the price on the market.

The relationship between the buyers and traders to the pig producers is seen as stable. At some point, they have expressed that the traders are benefitting more than them but they still try to maintain a good relationship with them, despite of the lack of written contracts. The relationship is based on trust and cooperation.

### **5.2.3. Market Channel and Infrastructure**

The way the pig producers market their produce is synonymous to the findings of the case study done by Rubzen, 2002, in Leyte, a province also in the Philippines, that the most common method of marketing is that traders or middlemen pick up the animals from the farm. This saves the farmer from transportation cost however the price given by the trader are relatively low. It is not a sole practice by this country, in a research conducted for the pork value chain in Benin, the most common path that the produce to come to market is through stockbreeder, trader, butcher, and consumers (Govoeyi, 2019). This is similar also to the context provided in the study of Ayomen, 2019, where it is described that the producers have the option to sell their produce either through traders and cooperative.

The constraints of this method of marketing lies on the relationship of the pig producers and the traders. According to the respondents of the focus group discussion, they have a negative perception of the traders. The pig producers think that the traders are the one benefitting from them. They did not also acknowledge the cost, or they just see the cost incurred by the traders as minimal and irrelevant. The pig producers have a notion that the traders are manipulating the prices of liveweight. This is generally claimed by the respondents of the three-island group. The presence of the traders makes it possible for the Visayas and Mindanao pig producers to have their produce transported to bigger markets such as Metro Manila. As practiced in the country, the ownership of the live animals is transferred already from the pig producers to the traders. The traders, who are now the owner of the live animals, are the ones who are able to access the bigger market. As for the pig producers, they still do not have the access to directly transport their produce to the market.

As claimed by the respondents of the focus group discussion, it will be beneficial for them if there are facilities that can process and transport their produce. One of the concerns of the pig producers is transport, due to the geographical feature of the country. It would need resources such as transport vehicle for live animals and slaughtering and processing facilities for them to be able to market their produce to the market. It would also benefit them if they can have access to processing facility that can package and store the meat, if they decide to market pork meat instead of live animals.

Cooperatives have a role in the marketing of the produce. For the pig producers that are members of the cooperatives, they were able to access market through the cooperative. According to the interviews conducted with the cooperative, one of the function and service that they have for the member is to market the produce. The cooperative serves as the hauler and trader, buys the live animals from the members. They serve as the trader that buys the produce and transport it to the wholesaler and retailer. The cooperatives that were interviewed has the marketing services.

### **5.3. Reflection**

This research was carried out with the intention of providing input to be used for formulating appropriate training for the stakeholders, understanding the current situation of the pig producers and as a supplement document for input to the “Hog Industry Road Map”.

The main objective of this research to assess the pork value chain, specifically the pig producers' situation to be able to gather information. This uses the parameters of productivity and governance. It is a prime time to conduct this research as the current situation of the pork industry calls for the assessment of the value chain. The research topic evolved in the pork value chain. The main consideration for this area is that the researcher is currently employed as an Agricultural Extension Officer of ATI-International Training Center on Pig Husbandry. The agency is a specialized center for pig husbandry.

Doing research was part of the search for possible understanding and solution to a problem. The big picture, or the main problem, may not be addressed by one research, but research conducted can contribute towards providing understanding to the problem, therefore, a solution eventually. It was never my intent to provide a solution to the pressing problem of our pork industry, but rather, an understanding on what is the situation of the most vulnerable actor of the chain.

### **Methodology**

The duration to conduct the research, including the proposal stage, was about three months. Planning is an integral part of the research. Consultations were also done with the commissioner on what they want to achieve in this research. It was a painstaking task since the beginning as there were conflicts with the understanding on the range of the topic coverage of the research. As agreed, both productivity and governance will be taken into context. Methods and strategies to be adapted were taken into consideration, as well as the current context, doing the research in the midst of COVID 19. Data gathering was the most affected activity in this research. The study was conducted remotely, as field data gathering will not be possible due to the restrictions imposed due to COVID 19. Association with local government extension workers and LGU officers proved to be of greater help during the process as they were able to provide assistance in data gathering.

Quantitative and quantitative data were both considered as necessary in this research. Strategies that were used in data collection were desk study and survey. Structured questionnaire was utilized in the online survey while semi-structured interview was conducted through online meetings. The total number of respondents for the survey was forty-five. Triangulation of information gathered through results of interview, survey and desk study were also done.

Analysis of data was done through the use descriptive analysis and Chi-square test (through SPSS). Interview proceedings and highlights were processed and translated into narratives. Results gathered enable the researcher to come up with the answers to the sub-questions. The power-interest matrix and the pork value chain were derived from the output of the interviews and discussion.

### **As a Researcher**

There are various roles that is taken into account during this research process. Since, this is an individual research, this has become a multi-faceted task. The researcher serves as the interviewer, the moderator, a note taker and all other responsibility for the research. It was a challenging task given the period of time of doing the research. But the knowledge and skills gained through the previous modules facilitates and enlightened the research. Research is a tedious task, but with the knowledge gained previously, the task becomes more bearable. Difficulties are still encountered but was managed well.

Doing the research, in the context of the current pandemic made the research more interesting. This is not the usual set up that a research is conducted. Field immersion and activity is a vital part of research, but with the restrictions some activities are not possible. Movements and travel had

become restricted. Despite the desire to have all the information secured through extensive first-hand experience, it becomes near impossible. But the situation proves to be a venue to explore new channels that in this “internet” age has made possible. Data collection were still conducted, but in an online platform. Meetings and interviews were made possible through the accessibility of internet, that makes one feel that it is still being conducted on a face-to-face scenario.

Initially, as a researcher, I felt that the task is challenging and near impossible to do, given the fact that my topic was extended to another subject. Initially, I would like to focus only on productivity and linked it with the training modalities of my agency. But I was challenged to include chain governance to the topic. It was an “abstract” concept for an ordinary pig producer and was not given much emphasis, but it proves to be important as I go on the research. It needed more time explaining and describing but I felt good when the respondents also realize the importance of the concept and that they are already into it without them knowing it. It has become a good focus of the research, that aside from the quantifiable aspects of production, it is true that chain governance plays a major part with the chain facilitation and relationship within.

### **Looking forward,**

I came to realized that more than finding a solution, an understanding on the situation of the pig producers through the research is what is important right now. How they operate, what they still need could be a starting point on finding solution to the current problem with our pork value chain. More than looking into the increasing the volume available in the market, it is better to go to the root of the problem. I gained knowledge and skills through this research experience. Despite the fact that a lot of challenge and hindrance comes along with it, learning to deal with the complexity it brought up has change also my perspective towards research. Research, for me does not follow an answer in the end, but can provide you options of what to do and how to do it. The learnings in this research are a good base on engaging to future research and dealing with my work.

## **CHAPTER VI. CONCLUSION**

This study was conducted to assess the pork value chain, specifically the pig producers' situation to be able to gather information that will contribute to the development of appropriate trainings for the stakeholders, input to the "Hog Industry Road Map" and policy formulation that will aid in the rebuilding of the pork industry. The study looked into the productivity, in terms of the volume of production, value share, input to production, access to finance and the political and economic environment. This study also considers the value chain governance, the relations within the range of the pig producers and the immediate actors in the value chain. The following conclusions are derived from the data gathered through survey, interviews, desk research and discussions with the pig producers.

### **6.1. Productivity**

The decline on the volume of production depicts the effect of the prevailing disease of the country as reflected with the decline in inventory and volume of production from 2018 to 2020. While it is true that the industry suffered too much and affected the livelihood of the pig producers, the farmers still believed in restarting the production amidst the current situation. For the affected pig producers, their desires are very evident as they have mentioned during the focus group discussion, despite of the losses incurred.

The study show that the pig producers take into consideration the aspects to production. They utilize available technology and practices to upgrade their production. They are also knowledgeable on the implications of adhering to it, as to the breeding and feeding practices. They validate that the aspects of production, the breeds, feeds, management and health aspects are taken consideration in their production. The access to finance, was affected of the requirements for securing it. There are numerous financial programs by the government, but the pig producers are struggling to access it due to the requirements and process. It is therefore concluded, that pig producers take into account the need for knowledge and technical skills in the aspects of production such as breeding, feeding, management and health.

The access to finance, or the financial aspects of the pig production are seen by the producer to impact the activity. For the pig producers, majority of them utilized their own money and savings in starting the business. Financial assistance is available, as claimed by the government entities and intermediaries but it is seen by the pig producers as not easily accessed. It is cited that the documentation requirements such as registrations and financial statements, hindered that accessibility for the pig producers. Despite of this, there are some pig producers who were able to access aids and grants, either from the government or NGOs such as cooperative. In general, it is concluded that there are available financial mechanisms from the government but the majority of the pig producers find it difficult to access and avail.

The government, through different programs and projects, are reaching the pig producers to assist them in this situation. However, it can be noted that some of these programs have not yet reached some of the producers who have been affected. For these pig producers, these programs will not be viable for them. The political-economic environment can still be described as conducive for the pig farmers despite the requirements of the government in establishing a pig farm. In totality, these regulations were put into place to protect the pig producers' interest as well the environmental concerns (with emphasis to the ECCs).

In the area of productivity, it is concluded that the occurrence of disease, ASF, has affected the volume of production thus affecting the available supply in the market. Not only the supply was affected, but

importantly, the livelihood of the pig producers. In order to facilitate the rebuilding of the pork sector, the pig producers should continually be provided by technical support in the aspects of production.

The limited knowledge of the pig producers in the area of finance, recording and registering the farms has hindered the possibility of accessing available financial programs and support. These financial mechanisms are available, as illustrated on different publishing by the government, but there are still “qualified” pig producers that are not able to access it. It can be a negative perspective for the government, since the pig producer might think of the programs as just “lip service” and negatively political in nature. The fact that it is available, it should also be accessible for all pig producers who are in need, whether it is to rebuild their business or to expand. The gap between the accessibility is evident. Availability is not the problem, but accessibility. To conclude, the intent and objective of the programs of the government, and the government itself, is more than just on paper. It is made for the pig producers that needs support in this challenging times. The problem that needed to be addressed is the access of the pig producers. Document requirements should be understood by the pig producers and the importance of it. Through this, accessibility can be improved. The facilitating agencies of the program should make the requirements easier to understand and complied by the pig producers.

## **6.2. Chain Governance**

The market type of governance is very common, even in other commodities that is being produce. Price has always become determinant whether to contract or not. Since, pig production is not different from the rest, most of the times the exercise of influence came from those who have the financial capacity over the chain. There are ways to change this, since in this set up, the producer becomes vulnerable. The mediation of the national associations and federations can safeguard the interest of the pig farmers, since most of them are producers themselves. Cooperatives have also a role, as visualize from the practice of one of the interviewed cooperatives. They can be a lead firm that can have influence in the chain if the farmers are not yet ready in taking initiatives. Currently, though there is a disagreement between the claims of the producers and the traders/buyers, it is evident that the traders/buyers are the lead firm. They influence the price and also, they have control over what type and quantity of live animals they would buy. The National Hog Raisers Association and Federation has influence also over the chain. As most of the respondents mentioned, the pricing is also dependent and adheres to the published price of the association, though there are instances that buyers/traders deviate from it. In one way, this influence has also safeguarded the interest of the pig producers into some extent.

It is the misunderstanding of the actors of the chain, or the perception of the pig producers that have impact on the relationship within the chain. Though trust and dependence are evident, since there are no written contracts between the pig producers and the traders/buyers, there is still notion from the pig producers that the traders are the one benefitting from them. The understanding on how traders do their business should reach the knowledge of the pig producers. The traders must also be transparent on how they do their business and should not also doubt extension officers that are doing their job of facilitating trade relations between the actors of the pork value chain.

Cooperatives and association can have a major role in improving trade relations and access to market of the pig producers. They have the capacity to negotiate and mediate between the pig producers and the market. The members have trust on them; therefore, a good relationship could be established. This can facilitate an efficient marketing for the pig producers.

As a conclusion, the pork value chain does not have yet a strong “lead firm”. Vulnerability of the chain actors are evident. There are possibilities of improving the chain, as well as the governance. The power in the chain is divided depending on what area is on context. Price is a major factor; thus, the

financial aspect of pig production is the most focused aspect for all the actors. It has become a determinant. Improving the chain relation would influence the productivity of the chain and the improvement on the perspective of the pig producers.

## **CHAPTER VII. RECOMMENDATION**

This study proposes the following recommendation to the commissioner and stakeholders of the pork value chain.:

### **1. ATI-International Training Center on Pig Husbandry, Commissioner**

The primary goal of this research for the commissioner is to know what is the capacity of the pig producers in terms of the aspects of production. The commissioner would also like to verify the factors affecting productivity, where in this study are the aspects of production, access to finance, and the enabling environment. Knowledge and skills are input to productivity. This research also considered not only the “near” pig producers in terms of location. It is found in this research that the pig producers are adapting to recent technologies and update. But there are still pig producers who expresses the needs to be equipped with that knowledge so that they can update their practice. With this consideration, it is better for the training center to explore more means of propagating new knowledge and skills to all pig producers. This will improve their productivity.

It is also recommended to them to explore venues in educating pig producers in the aspect of accessing finance, either through loans and grants. There is an evident hindrance in this area, and an awareness and knowledge on how they can access it would benefit the pig producers. It will also remove the stereotype of the pig producers that these programs are not “friendly” to them. Aside from these, it is also recommended to them that they mediate in providing an understanding for the actors of the chain in the area of governance. This is a vague concept for most of the actors. Enlightening them on this aspect would also be beneficial for the whole chain.

As one of the agencies facilitating the formulation and conceptualization of the “Hog Industry Road Map”, the data and responses derived from this research should be used as a baseline information. This can be used as a starting point for a more comprehensive look at the pork value chain and gather extensive information to be used for the conceptualization of the Hog Industry Road Map 2022 – 2027.

### **2. Department of Agriculture, National Livestock Program**

The study revealed that there are accessibility concerns with the current programs and projects for the rebuilding of the pork industry, in the midst of the ASF issue. The agency should conduct an initial assessment of these programs and evaluate the extent of the reach of the programs. In this way, they can make necessary intervention that can make the program more beneficial to the pig producers. It is also recommended that they evaluate and assess the current document requirements in availing the program. Devising an easy to do and understand requirement is also recommended for them, to help ease the difficulty of the pig producers.

### **3. The National Hog Raisers Associations and Federation**

The National Hog Raisers Associations and Federations should continue to support their member, as they are pig producers themselves. They have already an influence to the chain, and it is a good starting point to even strengthen the lobbying and coordinating power they possessed. This is an opportunity for the pig producers to have a representation to government initiatives and decisions.

It is also recommended to them to strengthen their influence and relationship with the government. A cooperation should be established.

### **4. The Hog Raisers Cooperative**

Engaging the pig producers and taking more initiative in the marketing is recommended for the cooperative to act on. The trust of the members of these cooperatives is very evident, and it is

visualized with the interviewed cooperatives, they were able to succeed in marketing their members' produce. This bridge the members to a market, without them feeling exploited by the traders. Another recommendation for them is if it is not possible to market, they should coordinate to buyers and link the producers to buyers. In this way, the cooperative of pig producers will be able to mediate between them and therefore stabilize price.

Further research, with consideration to gender perspective is recommended. In this research, the pig producer is taken as a neutral entity, and as a farm entity without consideration on gender. It would be an area of interest to look at the same issue with gender as a perspective, especially to access to finance and technical skills and knowledge.



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## ANNEXES

### Annex 1. Survey Questionnaire.

The Pork Value Chain of the Philippines is currently of concern due to the prevailing issue with disease and other factors. There is a need to generate information that will be used for formulating programs, trainings and input to policy directives that will be beneficial for the pork industry. With this in mind, this research is conducted in line with the requirements of the degree of MSc Agricultural Production Chain Management – Livestock Chain. This study is conducted by Rhea E. Carandang, international student of MSc APCM, at Van Hall Larenstein, University of Applied Science in Velp, the Netherlands. The researcher is also working as an Agricultural Extension Worker, a Training Specialists at ATI-International Training Center on Pig Husbandry.

The purpose of this survey is to generate your perspective on the current situation of the pork value chain in the producers' context. Your answers will be treated with confidentiality, and will solely be used for the purpose of this research.

The survey questionnaire will take about ten minutes to answer. Rest assured of the anonymity of the respondents. Thank you.

DIRECTION: Tick the box of your choice of answer.

A. GENERAL INFORMATION:

1. Where is the farm located? Region (please check):

<input type="checkbox"/>	IVA - Calabarzon
<input type="checkbox"/>	VII – Central Visayas
<input type="checkbox"/>	X – Northern Mindanao

2. What is the classification of your farm location?

<input type="checkbox"/>	Urban
<input type="checkbox"/>	Rural
<input type="checkbox"/>	Peri-Urban

3. Farm Type:

<input type="checkbox"/>	Small-scale (Backyard), with less than 10 sows
<input type="checkbox"/>	Commercial, Small Scale, less than 100 sows and purchase commercial feeds
<input type="checkbox"/>	Commercial, Medium Scale, have 100 to 300 sows, business permits, and specialized farm structures.
<input type="checkbox"/>	Commercial, Large Scale, more than 300 sows, own boars and breeders, and implement artificial insemination (AI). Operates own feed mills, keep computerized farm records, have business permits, and usually have a water treatment facility for the farm.

4. How many years in operation? \_\_\_\_\_

5. What do you produce? Type of Production:

	Farrow to Finish
	Weaner Production
	Finisher Production

6. In a month or cycle, how many animals are you able to produce?

\_\_\_\_\_ heads finishers      per month / per cycle

\_\_\_\_\_ heads weaners      per month / per cycle

## B. PRODUCTIVITY:

Breeds and Breeding:

7. For pig producers that are keeping sows, what type of sow do you keep?

	Pure Breed
	Cross Breed
	Hybrid
	No available information

8. Reason for using the type of sow:

	As advised by farm consultant (private practitioner)
	As advised by extension worker (government/NGO/Cooperative)
	Personal preference
	As advised by the supplier
	As practiced by other producers
	Other, please specify:

9. Breeding Practice: How do you breed your sows?

	I own a boar, through natural/pen mating
	Natural/pen mating through boar services
	Artificial Insemination, using on farm processed semen
	Artificial Insemination, processed semen from AI Centers
	Mixed, practice AI and natural mating

10. Who breeds your sows (for AI)?

	Farm owner and/or farm technician
	Extension Worker / Technician from Go, NGO or Cooperative
	Private technician (hired)

11. Reasons for the breeding practice:

	As advised by farm consultant (private practitioner)
	As advised by extension worker (government/NGO/Cooperative)
	Personal preference
	As advised by the supplier
	As practiced by other producers
	Others, please specify:

Feeds and Nutrition:

12. What type of feeds do you use?

	Commercially available feeds
	Own processed feeds
	Readily available food scraps, vegetable and farm waste
	Mixed (any combination of the three)
	Others, please specify

13. What is your consideration in choosing the type of feeds?

	Availability and accessibility
	Cost
	Personal preference
	As advised by the supplier/agent
	Others, please specify

14. How do you administer feeding?

	With the use of feeding guide, learned through training
	As advised by the feed supplier/agent
	As practiced by others, learned from other farmers
	Others, please specify

15. The nutritional benefit is the main consideration on choosing feeds and feeding methods for your animals?

	Yes
	No

16. How do you know about the nutritional content and benefits?

	Through the trainings attended
	Through the information from the feed supplier/agent
	Had heard from other farmers
	Not applicable

Farm Administration and Management:

17. Who manages the farm?

	Farm owner/Pig Producer
	Farm Manager, hired personnel
	Other, please specify

18. Who make the decision for the farm?

	Farm Owner/Pig Producer
	Farm Manager, with agreement with the Farm owner



	Farm Manager
	Other, please specify

19. Do you maintain farm records?

	Yes, please specify
	No.

If No, please state reason: \_\_\_\_\_

20. Do you have a health and/or vaccination program for your animals?

	Yes, please specify
	No.

If No, please state reason: \_\_\_\_\_

21. Waste Management: Do you have on-farm waste management facilities?

	Yes, please specify
	No.

#### Access to Finance

22. How much capitalization was required on starting up your pig raising business?

\_\_\_\_\_

23. Where did you acquire your capitalization (Source of finance)?

	Own money (personal saving and/or other earnings)
	Loan from Bank
	Loan from Cooperative
	Financial Assistance (Government/NGO)
	Others, please specify:

24. Did you encounter difficulty in securing capitalization through banks and financial institution?

	Yes
	No

25. What are the reasons that resulted in the difficulty in securing capitalization?

	Legal requirements and documents (guarantee, ownership and assests)
	Unavailability of farm financial records (Proof of operation)
	Unavailable information and/or guide on how to secure a loan or grant
	Others, please specify

26. If applicable, in terms of securing a loan or grant, in the scale of 1 to 5, rate the ease of securing such from various agency?

Type of Loan and Source	Very Difficult (1)	Difficult (2)	Neutral (3)	Easy (4)	Very Easy (5)
Loan, from banks					
Loan, from cooperative					
Loan, from other financial institution					
Grant, from Government					
Grant, from NGO					

\_\_\_\_\_ I have not secured any loan from any of the mentioned sources.

#### Political-Economic Environment

27. In the scale of 1 to 5, rate among the regulations that have the most influence on your operation.

Regulations	Low (1)	Moderate (2)	High (3)
Business Permit (from LGU)			
Zoning			
Environmental Compliance Certificate, Waste Management			
Republic Act, such as Clean Air Act and Clean Water Act			
Good Animal Husbandry Practices (GAHP)			

28. In the scale of 1 to 5, how do you rate the ease of pig raising as a business, registering and legalizing operation?

Ease of Pig Raising as a Business	Very Difficult (1)	Difficult (2)	Neutral (3)	Easy (4)	Very Easy (5)

#### C. CHAIN RELATION AND MARKET CHANNEL

29. How do you market your produce?

	Through the cooperative
	Through Direct Selling, walk-in clients
	Through contracts, with existing traders

	Others, please specify:
--	-------------------------

30. Who buys your produce?

	Traders
	Cooperative
	Direct Buyer
	Others, please specify:

31. In a month, how many are you able to sell?

\_\_\_\_\_ Number of Heads Finisher

\_\_\_\_\_ Number of Heads Weaner

32. Who determine the farm gate price for your farm?

	Owner, pig producer sets the price to buyers
	Cooperative
	Traders/Buyers
	Price is based on producers' association
	Others, please specify:

33. Who dictates the specifications of the produce being sold?

	Owner, pig producer sets the specifications
	Cooperative
	Traders/Buyers
	Specifications are based on producers' association and/or government
	Others, please specify:

34. In a scale of 1 to 5, how do you rate the ease of procuring supplies (breeds, feeds, biologics):

Please check.

Input	Very Difficult (1)	Difficult (2)	Neutral (3)	Easy (4)	Very Easy (5)
Breeds					
Stocks (for finisher production)					
Feeds					
Biologics					
Farm Equipment					
Technical Support					

## Annex 2. Interview Guide

### Key Informant

#### Interview Guide:

##### I. Introduction

In every interview, introduction of the research and the rationale will be mentioned and clarified to the interviewee.

##### II. Guide Questions:

###### a. Introduction of the Interviewee (Name, Position, Job Description)

###### b. For Cooperative:

1. How many members do you have?
2. How does a producer become a member?
3. What are the benefits that the producer gains with the membership with the cooperative?
4. What are the services that you offer to the producers?
  - a. Do you buy produce of the members?
  - b. Do you supply them input?
  - c. Who sets the price?
5. Who manages the cooperative?
6. What is the main activity of the cooperative?
7. How do you interact with your members?
8. Are they part of the decision-making process?
9. How do they reach you for any concerns and/or suggestions?

###### c. For the Extension Workers:

1. How would you describe the producers that you have been assisting in your area?
2. What could be done to improve their production practice (if any)?
3. What are the services provided by the organization to the farmers?
4. In your point of view, what are the areas that needed to improve for the pig producers? As well as on your part, as you are providing services to them?
5. In your area, how does the producers sell their produce?
6. In your observation, how do the producers' response to the traders? Cooperative? Suppliers?

###### d. For the National Livestock Program Representative:

1. Currently, what is the performance, in terms of productivity of the pork sector?
2. What are the interventions that the program has done with the current situation of the pork industry?
3. What are the programs that the organization has planned for the pork sector?
4. What is the reception of the producers with the programs that has been implemented? Why?

e. For Traders:

1. How do you operate?
2. Do you have contracts with the producers?
3. What are the requirements for the producer to be able to have contract to you?
4. Who sets the requirements? The standards? The price?
5. What are the challenges that you have encounter in doing this business/activity?
6. Describe your relationship with the pig producers?

### **Annex 3. Focus Group Discussion Checklist**

#### Focus Group Discussion

##### Guide Topic

- I. For Focus Group Discussion
  - a. Topic: Challenges on the production level and marketing their produce
    - 1. What are the challenges that they are encountering in terms of production?
    - 2. On marketing their produce, describe how they sell? Is there a difficulty in marketing?
    - 3. On the aspect of acquiring input supply, what are the challenges they are encountering?
    - 4. How do you see the traders? Describe your relationship with the traders.
  - b. Topic: What can be done better, in terms of production, marketing and chain relation.

#### Annex 4. Respondents' Profile

Respondent number	Farm Location	Farm Location Classification	Farm Type:	Years in Operation	Type of Production
2	Luzon	Rural	Small-scale (Backyard), with less than 10 sows	2	Finisher Production
3	Luzon	Rural	Small-scale (Backyard), with less than 10 sows	6	Farrow to Finish Production
6	Luzon	Rural	Commercial, Large Scale, more than 300 sows, own boars and breeders, and implement artificial insemination (AI). Operates own feed mills, keep computerized farm records, have business permits, and usually have a water treatment facility for the farm.	30	Farrow to Finish Production
8	Luzon	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	37	Farrow to Finish Production
10	Luzon	Rural	Small-scale (Backyard), with less than 10 sows	1	Farrow to Finish Production
11	Luzon	Rural	Small-scale (Backyard), with less than 10 sows	2	Farrow to Finish Production
12	Luzon	Rural	Commercial, Medium Scale, have 100 to 300 sows, business permits, and specialized farm structures.	0	Farrow to Finish Production
15	Luzon	Rural	Small-scale (Backyard), with less than 10 sows	11yrs.	Farrow to Finish Production
16	Luzon	Peri-Urban	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	5	Farrow to Finish Production
17	Luzon	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	8	Farrow to Finish Production
18	Luzon	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	1.5	Farrow to Finish Production
19	Luzon	Rural	Commercial, Medium Scale, have 100 to 300 sows, business permits, and specialized farm structures.	10 years	Farrow to Finish Production
22	Luzon	Urban (Lungsod o kabayanan)	Small-scale (Backyard), with less than 10 sows	6years	Finisher Production
23	Luzon	Peri-Urban	Small-scale (Backyard), with less than 10 sows	7yrs.	Finisher Production
24	Luzon	Peri-Urban	Small-scale (Backyard), with less than 10 sows	1	Finisher Production

26	Mindanao	Rural	Small-scale (Backyard), with less than 10 sows	10 years	Farrow to Finish Production
29	Mindanao	Rural	Small-scale (Backyard), with less than 10 sows	7	Farrow to Finish Production
30	Mindanao	Rural	Small-scale (Backyard), with less than 10 sows	6	Farrow to Finish Production
32	Mindanao	Urban	Small-scale (Backyard), with less than 10 sows	3years	Weaner Production
33	Mindanao	Peri-Urban	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	20 yrs	Farrow to Finish Production
4	Mindanao	Rural	Small-scale (Backyard), with less than 10 sows	5yrs	Farrow to Finish Production
7	Mindanao	Rural	Small-scale (Backyard), with less than 10 sows	2	Finisher Production
14	Mindanao	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	3 years	Finisher Production
20	Mindanao	Rural	Small-scale (Backyard), with less than 10 sows	10years	Farrow to Finish Production
21	Mindanao	Peri-Urban	Small-scale (Backyard), with less than 10 sows	2	Farrow to Finish Production
28	Mindanao	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	4	Farrow to Finish Production
34	Mindanao	Urban	Commercial, Large Scale, more than 300 sows, own boars and breeders, and implement artificial insemination (AI). Operates own feed mills, keep computerized farm records, have business permits, and usually have a water treatment facility for the farm.	12	Farrow to Finish Production
35	Mindanao	Rural	Small-scale (Backyard), with less than 10 sows	Almost 5 yrs	Farrow to Finish Production
36	Mindanao	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	36	Finisher Production
37	Mindanao	Urban	Commercial, Medium Scale, have 100 to 300 sows, business permits, and specialized farm structures.	32	Farrow to Finish Production
38	Visayas	Urban	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	36	Farrow to Finish Production
39	Visayas	Urban	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	30	Farrow to Finish Production



40	Visayas	Urban	Commercial, Medium Scale, have 100 to 300 sows, business permits, and specialized farm structures.	34	Farrow to Finish Production
41	Visayas	Urban	Commercial, Medium Scale, have 100 to 300 sows, business permits, and specialized farm structures.	36 years	Farrow to Finish Production
42	Visayas	Urban	Small-scale (Backyard), with less than 10 sows	3	Finisher Production
43	Visayas	Rural	Commercial, Medium Scale, have 100 to 300 sows, business permits, and specialized farm structures.	11	Farrow to Finish Production
44	Visayas	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	3	Finisher Production
45	Visayas	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	31.8	Finisher Production
1	Visayas	Rural	Small-scale (Backyard), with less than 10 sows	3	Farrow to Finish Production
5	Visayas	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	11 years	Weaner Production
9	Visayas	Peri-Urban	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	9 months	Farrow to Finish Production
13	Visayas	Rural	Commercial, Small Scale, less than 100 sows and purchase commercial feeds	4 years	Farrow to Finish Production
25	Visayas	Rural	Small-scale (Backyard), with less than 10 sows	4 years	Farrow to Finish Production
27	Visayas	Rural	Small-scale (Backyard), with less than 10 sows	20 (university instructional project)	Weaner Production
31	Visayas	Urban	Small-scale (Backyard), with less than 10 sows	6	Weaner Production

## **Annex 5. Key Informants**

### **Agricultural Extension Worker**

1. Agricultural Technician II  
Misamis Occidental, Philippines
2. Provincial Veterinary Office  
Cebu, Philippines
3. Training Specialist III  
ATI-International Training Center on Pig Husbandry  
Lipa City, Philippines
4. Training Specialist II  
ATI-International Training Center on Pig Husbandry  
Lipa City Philippines

### **National Government Agency**

1. Department of Agriculture  
National Livestock Program
2. Agricultural Training Institute  
International Training Center on Pig Husbandry

### **Cooperative**

1. Sabang (Ibaan) Multi-Purpose Cooperative
2. Tanauan Hog Raisers Cooperative
3. Soro-soro Ibaba Development Cooperative

### **Traders**

1. Area of Operation: Batangas Province
2. Area of Operation: Negros Occidental

## Annex 6. Statistical Tests and Results

### Frequency Table

		Farm Location			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Luzon	15	33.3	33.3	33.3
	Visayas	15	33.3	33.3	66.7
	Mindanao	15	33.3	33.3	100.0
	Total	45	100.0	100.0	

		Breeding Practice			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I own a boar, through natural/pen mating	5	11.1	13.9	13.9
	Natural/pen mating through boar services	1	2.2	2.8	16.7
	Artificial Insemination, using on farm processed semen	19	42.2	52.8	69.4
	Artificial Insemination, processed semen from AI Centers	5	11.1	13.9	83.3
	Mixed, practice AI and natural mating	6	13.3	16.7	100.0
	Total	36	80.0	100.0	
Missing	System	9	20.0		
Total		45	100.0		

		Breed			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	pure breed	8	17.8	17.8	17.8
	cross breed	15	33.3	33.3	51.1
	hybrid	10	22.2	22.2	73.3
	no information	12	26.7	26.7	100.0
	Total	45	100.0	100.0	

		Feed Type			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Commercially available feeds	37	82.2	82.2	82.2
	Own processed feeds	2	4.4	4.4	86.7
	Mixed (any combination of the three)	6	13.3	13.3	100.0
	Total	45	100.0	100.0	

### What is your consideration in choosing the type of feeds?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Availability and accessibility	20	44.4	44.4	44.4
	Cost	7	15.6	15.6	60.0
	Personal preference	18	40.0	40.0	100.0
	Total	45	100.0	100.0	

### Do you have a health and/or vaccination program for your animals?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	39	86.7	86.7	86.7
	no	6	13.3	13.3	100.0
	Total	45	100.0	100.0	

### Who determine the farm gate price for your farm?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Owner, pig producer sets the price to buyers	15	33.3	33.3	33.3
	Traders/Buyers	17	37.8	37.8	71.1
	Price is based on producers' association	9	20.0	20.0	91.1
	Others	4	8.9	8.9	100.0

Total	45	100.0	100.0
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### Who manages the farm?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Farm owner/Pig Producer	30	66.7	66.7	66.7
	Farm Manager, hired personnel	15	33.3	33.3	100.0
	Total	45	100.0	100.0	

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
In a scale of 1 to 5, how do you rate the ease of procuring supplies (breeds, feeds, biologics) [Technical Support]"	45	2	5	3.22	.902
Valid N (listwise)	45				

### In a scale of 1 to 5, how do you rate the ease of procuring supplies (breeds, feeds, biologics) [Technical Support]"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Difficult	9	20.0	20.0	20.0
	Neutral	22	48.9	48.9	68.9
	Easy	9	20.0	20.0	88.9
	Very Easy	5	11.1	11.1	100.0
	Total	45	100.0	100.0	

### Case Processing Summary

		Where is the farm located? (please check):		Cases Missing		Total	
		N	Percent	N	Percent	N	Percent
In a scale of 1 to 5, how do you rate the ease of procuring supplies (breeds, feeds, biologics) [Technical Support]"	Luzon	15	100.0%	0	0.0%	15	100.0%
	Visayas	15	100.0%	0	0.0%	15	100.0%
	Mindanao	15	100.0%	0	0.0%	15	100.0%

### Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	5.830 <sup>a</sup>	6	.442
Likelihood Ratio	7.176	6	.305
Linear-by-Linear Association	.164	1	.686
N of Valid Cases	45		

a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is 1.67.