Revisiting the Adoption of the Philippine Good Agricultural Practices (PhilGAP) Certification Programme: A Case Study of Cavendish Banana Plantations

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Abstract

In Philippine Cavendish banana plantations, pesticides are applied to produce "perfect bananas" with unblemished peel and uniform maturity as required by the export markets. The increased use of pesticides has resulted in a number of food safety and sustainability problems such as excessive pesticide residues and environmental contamination. The Philippine government introduced a *PhilGAP* certification programme, a type of quality management system (QMS), for fruit and vegetables in 2005 to address these problems. A study initiated in 2011 revealed that there was no Cavendish banana plantation certified with *PhilGAP*. The study also identified the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme. Five years after the initial study in 2011, there are only two out of more than 700 Cavendish banana plantation growers that had been certified with *PhilGAP*. This study aims to investigate if the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme have changed since the initial study in 2011. A qualitative case study approach was used in this study. Data were collected through an in-depth interview, field observation and sourcing of relevant documents. The study used Rogers' (2003) adoption process as a tool to investigate the barriers to, and drivers of adoption. The data were analysed through qualitative data analysis using *Nvivo 11 Pro* software.

The results show that the barriers to the adoption of the *PhilGAP* certification programme in the Cavendish banana plantations identified in 2011 remain a problem. These barriers include: (1) knowledge, (2) cost, (3) processes, (4) rewards or incentives, (5) scale of farm operations, and (6) trade issues within the banana industry, particularly the practice of pole-vaulting. The emerging barriers identified by this research include sub-types of these barriers, namely: (1) the processes involved in the audit, particularly the disagreements on the concept of quality, the perceived lack of coordination, and the perceived lack of independence in the audit process; and (2) the trade issues in the industry, specifically the presence of splinter groups or non-accredited groups of banana growers, packing facilities, traders and exporters. A new category of barrier has also emerged which is the competition with the *GlobalGAP* certification programme, a competing technology and the gold standard QMS. Despite these barriers, the two *PhilGAP*-certified Cavendish banana plantations continue to participate in the programme because the drivers of adoption outweighed these barriers.

The results also show that the drivers of the adoption of the *PhilGAP* certification programme identified in 2011 has led to the adoption of the programme. These drivers include: (1) the requirements of the international market; and (2) the presence of a quality-focused corporate culture being forward-looking and open to change. The emerging drivers identified by the research include: (1) serves as a repository

that satisfies other types of government policies; and (2) the government subsidy that includes the provision of free certification services, and chemical residue analysis.

Previously identified barriers were overcome by the adopters, but remain to be a barrier for non-adopters. However, new barriers have emerged which continue to limit the adoption of the programme. On the other hand, previously identified drivers have led to the adoption of the programme, and newly identified drivers of adoption have motivated the continued participation in it. This research argues that the adoption rate of the *PhilGAP* certification programme for the Cavendish banana plantations remains low because many of the barriers to adoption have not been properly addressed by the government, and the benefits from adoption have not been properly communicated to the intended adopters.

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List of Acronyms and Abbreviations

ASEAN	Association of Southeast Asian Nations
ATI	Agricultural Training Institute
BAFS	Bureau of Agriculture and Fisheries Standards
BPI	Bureau of Plant Industry
CEO	Chief Executive Officer
CFO	Chief Finance Officer
CIA	Central Intelligence Agency
COO	Chief Operating Officer
CPCC	Control Points and Compliance Criteria
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DOLE	Department of Labor and Employment
FAO	Food and Agriculture Organization
GAP	Good Agricultural Practices
GAPCC	GAP Certification Committee
GDP	Gross Domestic Product
GlobalGAP	Global Good Agricultural Practices
IRR	Implementing Rules and Regulations
ISO	Internal Organization for Standardization
LGU	Local Government Unit
NDLF	Nonoy Librado Development Foundation
NEDA	National Economic Development Authority
NGO	Non-Government Organization
PBGEA	Pilipino Banana Growers and Exporters Association
PhilGAP	Philippine Good Agricultural Practices
PPE	Personal Protective Equipment
PQS	Plant Quarantine Services
PSA	Philippine Statistics Authority
QMS	Quality Management System
TWG	Technical Working Group
UN	United Nations

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Chapter 1: INTRODUCTION

1.1 Background to the Problem

Cavendish bananas are the most economically significant fruit crop in the Philippines (Dela Cruz, Gueco, Damasco, & Huelgas, 2008). It is the Philippines' largest fresh crop export commodity in terms of value and volume (Antig, 2014). It posted an export revenue of US$ 947.43 million and a volume of 4.5 million metric tonnes, equivalent to 16.9% of total agricultural exports, in 2014 (Philippine Statistics Authority [PSA], 2015). The Cavendish banana is the preferred variety for export because of its better yield performance, extended shelf life and higher aesthetic value (Arias, Dankers, Liu, & Pilkauskas, 2003). Its economic significance to the Philippines has led to a 1.1% annual increase in the area under production since 2010 (Antig, 2014). At present, there are 84,000 hectares planted with this variety located on Mindanao Island in the Philippines (PSA, 2015). Thus, the Philippines has become the second largest exporter of Cavendish bananas in the world next to Ecuador, followed by Columbia, Costa Rica and Guatemala (Food and Agriculture Organization [FAO], 2014).

The continuous monoculture cropping of Cavendish bananas has promoted a favourable environment for large insect infestations and plant disease epidemics (Barraza, Jansen, van Wendel de Joode, & Wesseling, 2011; Jones, 2007). The damage caused by insects and diseases has affected the quantity and quality of harvested product and rendered some crops unfit for export markets (Molina & Fabregar, 2002). For example, Cavendish bananas have been rejected frequently in the export market since 2012 because of the detection of scale insects (*Aspidiotus destrcuctor)* in the shipment (West, 2012). Thus, banana companies have resorted to the application of different types of pesticides (herbicides, insecticides, fungicides, etc) at various stages of production in order to control weeds, insects and diseases (Aguilar, Lasalita-Zapico, Namocatcat, Fortich, & Bojadores, 2014; Espino et al., 2001). These practices produce "perfect bananas" with unblemished peel, uniform maturity and proper ripeness that meet the strict market requirements of importing countries (Calderon & Rola, 2003). For example, fungicide is applied at least 40 times a year to control *Sigatoka* Leaf Spot disease (Polidoro et al., 2008). Likewise, a plastic bag treated with insecticide is used to wrap banana bunches at least three times a week to protect the fruit against mealy bugs *(Dysmicoccus brevipes)* and scale insects (Vargas, 2006).

Pesticides are substances containing active ingredients in any form used to kill, control or modify behaviour or the physiology of organisms that damage the crops such as weeds, insects and pathogens (FAO and World Health Organization [WHO], 2014). The increased use of pesticides has resulted in a number of problems in the banana plantations (Wilson & Otsuki, 2004). For example, pesticide residues have exceeded maximum levels on some plantations (Lockie, Travero, & Tennent, 2014). Pesticide

maximum residue limits (MRLs) act as a food safety barrier to international trade. If this limit for bananas is exceeded, the crop cannot be accepted by the importing country (Business Mirror, 2015; González-Curbelo, Ravelo-Pérez, & Hernández-Borges, 2011). Pesticides can negatively impact the health of farming communities through chronic exposure (Panganiban et al., 2004). Furthermore, traces of persistent pesticides have been found in air and water, and these adversely affect the quality of the local environment (Alim et al., 2012; Lockie et al., 2014; Tirado & Bedoya, 2008).

One of the means of overcoming the problems caused by excessive pesticide use is through the introduction of a quality management system (QMS) such as *GlobalGAP* and the Philippine Good Agricultural Practices (*PhilGAP*) certification programme. Good Agricultural Practices (GAP) are the set of activities that aim to produce good quality food and non-food farm products without compromising their food safety, environmental sustainability, economic viability and social accountability (FAO, 2008). The consistent implementation of these practices can only be validated through a process of certification. *GlobalGAP*, formerly known as *EurepGAP*, is a private QMS and the "world's leading farm assurance programme" which has been in operation since 1997 (GLOBALGAP, 2015). Since then, it has served as a benchmark model for the development of several government-led GAP programmes in Kenya, Malaysia, Mexico and Chile (Valk & Roest, 2009). To reduce pesticide residue problems and maintain access to important export markets, the Philippine government initiated the development of *PhilGAP*, a public GAP programme. The *PhilGAP* programme was developed for fruit and vegetable production and post-harvest activities, harmonised with *GlobalGAP*, and introduced as a public standard in 2005 (Panganiban, 2005). The implementation of *PhilGAP* was then spearheaded by the Bureau of Agriculture and Fisheries Standards (BAFS) as the programme secretariat (Banzon, Mojica, & Cielo, 2013a). This role is currently in transition and the Bureau of Plant Industry (BPI) will replace BAFS at the end of 2016 (Rivera [Personal Communication], 2016). The *PhilGAP* programme is voluntary, and a *PhilGAP* certification process was set up to certify that growers were using the *PhilGAP* processes (Banzon et al., 2013a). In 2013, eight years after the implementation of the *PhilGAP* certification scheme, the programme was still considered in its "infancy stage" with only seven *PhilGAP*-certified farms including two banana plantations having obtained *PhilGAP* certificates (Banzon, Mojica, & Cielo, 2013b). In contrast, government-run GAP schemes in neighbouring countries in Southeast Asia have had much higher adoption rates than in the Philippines. For example, 170,000 farms in Thailand (Amekawa, 2013) and 575 farms in Vietnam have adopted government-run GAP programmes during the same period. *PhilGAP* is in its 11th year of implementation, and the number of *PhilGAP*-certified farms has increased to 74, but the number of certified Cavendish banana plantations remains the same as it did in 2013 (Roscom [Personal Communication], 2016).

To understand why the *PhilGAP* certification programme was not being adopted by Cavendish banana growers, Banzon et al. (2013a) initiated a study in 2011. There was only one banana plantation growing Cardava (a type of local banana) that had been *PhilGAP*-certified and there were no *PhilGAP*-certified Cavendish banana plantations in 2011. In this study, they identified the barriers that prevented banana growers from adopting the *PhilGAP* certification programme and they also identified the key drivers that could motivate other banana growers to adopt it. The main barriers included: (1) knowledge constraints related to a lack of awareness of the existence of the *PhilGAP* programme; (2) cost constraints in terms of compliance costs; (3) process constraints such as difficulty in complying with *PhilGAP* requirements and the risks associated with the *PhilGAP* certification process, which included growers not being able to get the certificate because of non-compliance despite the thorough preparation; (4) reward or incentive constraints such as the absence of a price premium or at least a floor price for the products from *PhilGAP*-certified farms; (5) size of farm operation or scale effects caused by the requirement for a 50-metre buffer zones around sources of drinking water; and (6) other issues in the Mindanao banana industry such as market competition and saturation. The drivers that could lead to the adoption of the *PhilGAP* certification programme included: (1) the requirements of the international market; and (2) the farmer's overall outlook on life or corporate culture.

The barriers identified by Banzon et al. (2013a) played important roles in limiting grower adoption of the *PhilGAP* certification programme despite the quality requirements of international markets. Banzon et al. (2013b) reported that as of February 2013 only two banana plantations had *PhilGAP* certification in the Philippines, of which one produced Cavendish bananas and the other produced Cardava bananas. However, the company that grows Cardava bananas has since been delisted as they did not submit an application for the renewal of the certificate (Rivera [Personal Communication], 2016). At present (2017), there are only two *PhilGAP*-certified Cavendish banana plantations in the Philippines and they are managed by a single corporation.

Since the Banzon et al. (2013a) study, the government of the Philippines has put more effort into the *PhilGAP* certification programme to overcome the barriers identified in the study (Mandigma, 2015). However, despite these efforts, no additional banana growers have adopted the programme since 2014. The implementation of the *PhilGAP* certification programme, as a public voluntary standard, is geared towards safe and sustainable food production as driven by the international market (Lockie et al., 2014). Retailer-led food production standards have become a default requirement in the agribusiness industry (Burrell, 2011). This study seeks to find out if the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme have changed since the Banzon et al. (2013a) study in 2011, which may shed light on the reasons for its poor uptake by Cavendish banana growers.

1.2 Problem Statement

Cavendish bananas are the most economically significant fruit crop in terms of value and volume in the Philippines. The continuous monoculture of Cavendish bananas has promoted a favourable environment for a variety of weeds, pests and pathogens. The damage caused by these organisms had affected the quality of the harvested product and rendered the crop unfit for export markets. To overcome this problem, banana companies apply a wide range of pesticides throughout the crop's production cycle. This practice produces "perfect bananas" with unblemished peel and uniform maturity. However, the increased use of pesticides has resulted in a number of food safety and sustainability problems such as excessive pesticide residues and environmental contamination. To this end, the Philippine government introduced the *PhilGAP* certification programme in 2005 for fruit and vegetables. A study initiated in 2011 identified that only one banana plantation growing Cardava bananas (a type of local banana) had adopted the *PhilGAP* certification programme and no Cavendish banana plantations had been certified with *PhilGAP*. The study also identified the barriers to, and drivers of, the adoption of *PhilGAP* certification programme. At the completion of that study in 2013, one Cavendish banana plantation had been added to the list of *PhilGAP*-certified farms. The Cardava banana plantation has been delisted from the list of *PhilGAP*-certified farms and replaced by another Cavendish banana plantation. Despite the government putting more effort into promoting the programme, at present, there has been no increase in the total number of banana plantations that have adopted the *PhilGAP* certification programme. The aim of this research is to investigate the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme since the initial study in 2011.

1.3 Research Questions

Thus, the research aims to investigate the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme in the Philippine Cavendish banana plantations. In detail, this study intends to answer the following questions:

1.) Do the same barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations identified by Banzon et al. (2013a) still exist or have new drivers and barriers emerged since the initial study in 2011?
2.) How have these barriers continued to limit the adoption of, or how have these drivers led to the adoption of, the *PhilGAP* certification programme in Cavendish banana plantations in the Philippines?
3.) Why do some Cavendish banana plantations adopt and continue to participate in the *PhilGAP* certification programme despite these barriers?

1.4 Objectives

The objectives for the study are to:

1.) Describe the current and emerging barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations and compare these to those identified by Banzon et al. (2013a) in 2011;
2.) Describe the effect of these barriers and drivers on the adoption of the *PhilGAP* certification programme for Cavendish banana plantations; and
3.) Explain the reasons behind the adoption and continued participation of some Cavendish banana plantations in the *PhilGAP* certification programme.

1.5 Positioning the Researcher

The role and biases of the researcher are crucial in examining a real-world problem (O'Leary, 2005). For this reason, a brief description of the researcher is provided in this section. I have an undergraduate degree in agricultural science with a major in plant pathology from the University of the Philippines College of Agriculture. Prior to pursuing my Master's degree in New Zealand, I worked in a multinational agrochemical company for nearly eight years with varying projects and roles from research and product development, regulatory affairs to market development for the Philippines and other Southeast Asian countries. During my employment, I was exposed to the technical practices, regulatory challenges and marketing issues of the Philippine Cavendish banana plantations. My personal and professional experiences have shaped my interest in pursuing research in agricultural systems, although my research background is not in the social sciences. To become an objective scientist and to gain the skills in qualitative research required for this study, I have undertaken a course in the appropriate methodology prior to undertaking this thesis project.

1.6 Thesis Structure

The research investigates the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations. The thesis is organised into eight chapters. It starts with the introduction, which covers the background, problem statement, research questions, objectives and the position of the researcher. Chapter 2 provides an overview of the Philippines and the agriculture sector including the Cavendish banana industry. Chapter 3 reviews the literature that focuses on previous studies and information relevant to the problem. Chapter 4 explains the research methodology including the research paradigm, strategy and design. Chapter 5 describes the case, and the results are described in chapter 6. The findings from the research are discussed and compared to the literature in chapter 7. Finally, in chapter 8 the conclusions from the study are presented.

Chapter 2: THE PHILIPPINE AGRICULTURE SECTOR AND THE CAVENDISH BANANA INDUSTRY – AN OVERVIEW

2.1 Introduction

This chapter provides a general context of the research and is divided into four main sections. Section 2.2 provides an overview of the Philippines and its agriculture sector. Section 2.3 describes an overview of the Cavendish banana industry and its development in the Philippines, productions systems, the minimum quality requirements and actors in the export industry. Section 2.4 provides the summary for the chapter.

2.2 Overview of the Philippines and its Agriculture Sector

The Philippines is an archipelago country in Southeast Asia located in the Western Pacific Ocean (Figure 1). It has three main geographic locations from north to south, namely: Luzon, Visayas and Mindanao (Official Gazette, 2016). Luzon Island contains the capital city of Manila, where all the national government offices are located.

Figure 1. Map of the Philippines showing the geographic boundaries (Balingit, 2007).

The Philippines follows a republican presidential form of government set by a constitution, in which the power is equally distributed among the three branches of the government, namely: legislative, executive and judiciary (Official Gazette, 2016). The Department of Agriculture (DA) is one of the government agencies under the executive branch. It is headed by the secretary, who oversees 10 sub-units within the agency, eight bureaus representing different agricultural segments, and 15 regional field offices (Figure 2). In addition, the Department of Agriculture coordinates with seven attached agencies and 13 government-owned corporations. Among these government units, two government agencies are directly involved as the programme secretariat of *PhilGAP* certification, namely: Bureau of Agriculture and Fisheries Standards (BAFS) and Bureau of Plant Industry (BPI). These two agencies, along with the other Department of Agriculture agencies, are directly involved in running the operations of the Philippine agriculture sector.

The agriculture sector plays a vital role in the Philippines as the primary source of food and raw materials for different industry and service sectors. It also provides a market for non-agricultural commodities, as a purchaser of farm inputs or consumer goods and services from non-agricultural sectors (Habito & Briones, 2005). Lastly, the agricultural sector provides surplus labour to the industry and service sectors as farming improves its practices and adopts new technologies. Thus, improvement in productivity and efficiency in agricultural operations is essential to ensure the availability and affordability of these agricultural products to both the local and export markets, and they subsequently contribute to the economy.

The agriculture sector used to dominate the country's gross domestic product (GDP) until the decline of the sector's contribution to less than 30% of GDP in the 1960s (Habito & Briones, 2005). By 1981, the agriculture sector's contribution to GDP further declined to 23% because of the growing industry and service sectors (Habito & Briones, 2005). In 2014, the agriculture sector accounted for only 10% of the country's GDP, while the industry and service sectors accounted for 31% and 59%, respectively (Central Intelligence Agency [CIA], 2016; PSA, 2014). The continuous decline in the contribution to the country's GDP can also be attributed to the slow growth rate of the agricultural sector at 1.4% in 2014 (PSA, 2014). Rice (*palay*) and corn posted the highest production volume as being the country's staple crops.

The agriculture sector also posted a total export value of US$ 6,546 million at a Freight-on-Board (FOB) price and an import value of US$ 9,632 million at a Cost, Insurance and Freight (CIF) price which contributed to 11% of the country's total exports and 14% of the country's total imports in 2014 (Figure 3). The leading agricultural export products are coconut oils and fresh Cavendish bananas while the leading agricultural imported commodities are soybeans, wheat and dairy products.

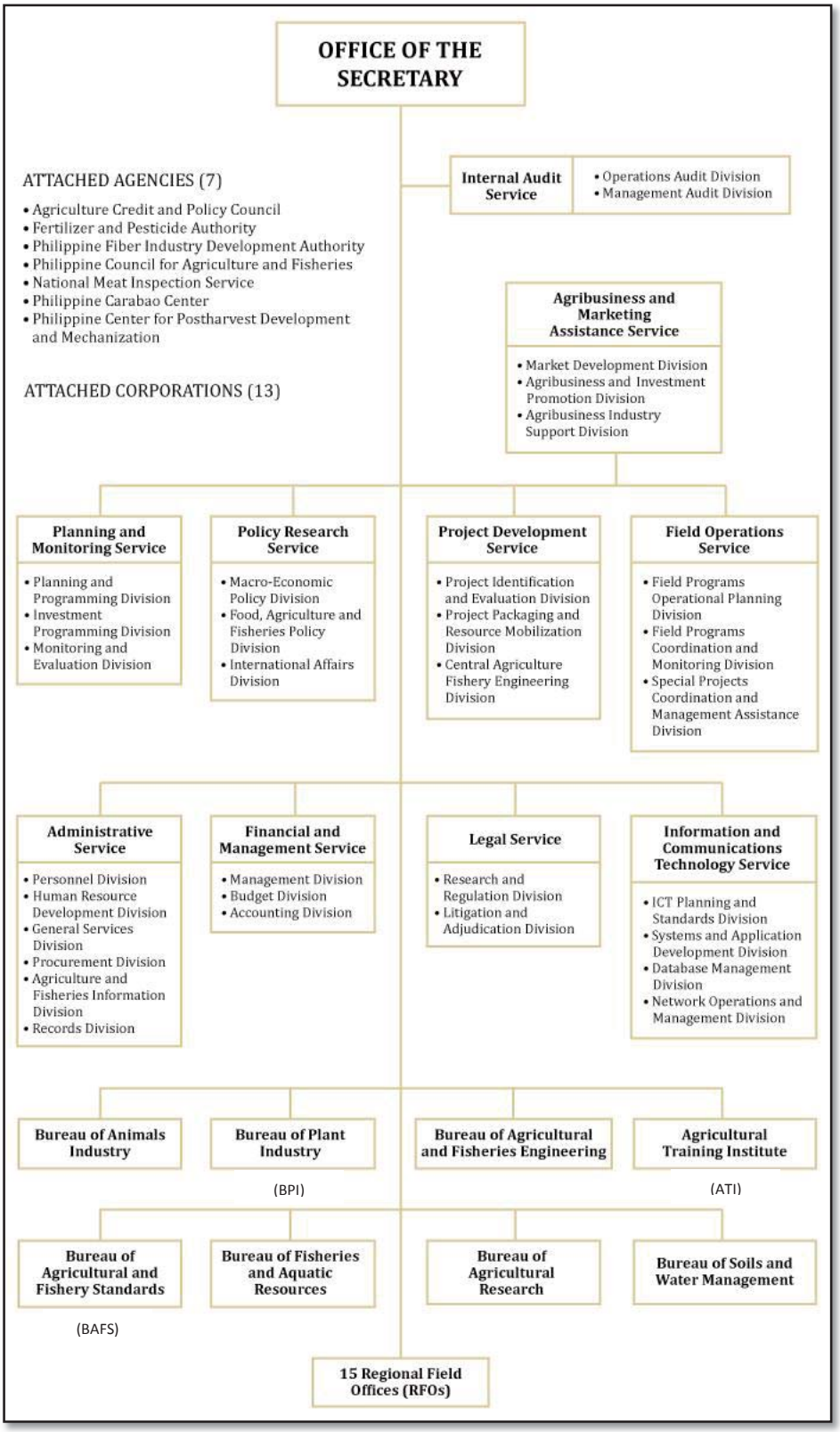


Figure 2. Organisational chart of the Department of Agriculture (DA, 2016).

External Trade

Value of total agricultural exports:	US$ 6,546 million f.o.b.
% agriculture in total exports:	11%
Top agricultural export commodities:	coconut oil (18%),
	banana fresh (17%),
	tuna (7%),
	pineapple and products (7%)
Major markets:	
coconut oil:	USA (46%), Netherlands (31%)
banana fresh:	Japan (35%), China (23%)
tuna:	Japan (25%), USA (21%)
pineapple and products:	USA (39%), Japan (16%)
Value of total agricultural imports:	US$ 9,632 million c.i.f.
% agriculture in total imports:	14%
Top agricultural import commodities:	soyabean oil/cake meal (10%), wheat & meslin (10%), milk & cream & products (8%)
Major suppliers:	
soyabean oil/cake meal:	USA (50%), Argentina (49%)
wheat and meslin:	USA (64%), Australia (17%)
milk & cream & products:	New Zealand (31%), USA (30%)
Agricultural trade deficit:	US$ 3,085 billion

Figure 3. Trade performance of the agriculture sector in the Philippines (PSA, 2014).

Despite the increase in the country's agricultural export by 5.78% in 2014, the country is still importing more agricultural commodities than exporting local produce to export markets because of several challenges. These challenges are discussed in the next section.

2.2.1 Challenges

The increasing demand for food and raw materials puts pressure on the agriculture sector to produce more output, but the National Development Economic Authority (NEDA) had identified three major challenges in obtaining its goal (NEDA, 2013). The first major challenge lies in the production itself because of: (1) the high cost of inputs such as fertilisers and pesticides; (2) inefficient logistics and supply chain systems that lead to post-harvest losses and expensive transaction and distribution costs; (3) insufficient irrigation facilities; (4) the low rate of technology adoption because of the weak linkage between the technology producers and extension workers, lack of technology promotion and the financial capacity of the intended users of the technology; (5) limited access to financing and credit institutions; and (6) agricultural land conversion to residential and industrial areas.

The second major challenge is the environmental conditions of farming, including the effects of climate change on agriculture and of agriculture on the environment (NEDA, 2013). Climate change has been

observed through erratic rainfall patterns, extended drought periods, warmer field conditions and the increasing frequency and intensity of typhoons. Climate change affects the cropping calendar, yield performance, pest pressure, crop losses and results in damage to the existing infrastructure. On the other hand, the unsustainable agricultural activities such as extensive use of herbicides, slash and burn practices, the expansion of grazing areas, and deforestation have led to soil erosion, degradation of water and air quality, and losses in biodiversity.

Lastly, NEDA (2013) has identified flaws in the policies and institutions involved in agricultural development. These flaws include: (1) the devolution of agricultural extension services to local government units (LGUs) with varying technical and financial capabilities; (2) contradictory policies in rice production and importation; (3) partial implementation of land distribution to farmers; (4) limited investment in public goods such as research and development projects, post-harvest facilities, and farm-to-market infrastructure; (5) inadequate investment in high-value and export crops; and (6) problems with the bureaucracies related to corruption, politicisation, overlapping functions and weak coordination (Habito & Briones, 2005). The policies and institutions are often edified with great plans and programmes to address sectoral issues, but the problem often lies in the implementation and monitoring of such plans or programmes (Habito & Briones, 2005). The different challenges faced by the agriculture sector are likewise present at varying degrees in the local banana industry.

2.2.2 Bananas in the Philippine Agriculture Sector

The banana is a perennial herbaceous crop and is considered to be the fourth most valuable food crop globally, next to wheat, maize and rice (Arias et al., 2003). The banana industry plays a vital role in the country's food security and economic development. It has contributed an annual average of 0.22% of the country's GDP growth rate (NEDA, 2013). Of the 8.6 million tonnes harvested in 2013, about 48.9% were Cavendish bananas for export (International Trade Centre [ITC], 2015; Padrinao, 2014). The rest of the harvest was used for domestic consumption including cultivars of the cooking banana Saba or Cardava variety (29.58%), the table banana Lacatan (10.76%), and other table banana varieties (10.74%). Bananas for domestic consumption are usually produced on small subsistence farms with limited technology. In contrast, Cavendish bananas that are produced for international markets are grown on large plantations using modern technology and farming practices. The Cavendish banana industry is described in the following section.

2.3 Overview of the Cavendish Banana Industry

The Philippine Cavendish banana industry began in South Cotabato, a province on the island of Mindanao, in 1966 (Antig, 2015). The export business flourished in the 1970s and has become a significant contributor in the global trade of fresh fruit (Nonoy Librado Development Foundation [NLDF], 2013; Pilipino Banana Growers and Exporters Association [PBGEA], 2015). The Cavendish is the most preferred banana cultivar for export because of its better yield performance, longer shelf life, superior quality and aesthetic value (Arias et al., 2003; FAO, 2015a). Since the 1970s, the industry has expanded to other locations on Mindanao Island because of its suitable climate and fertile soils for banana production (Antig, 2015). Most of the provinces in Mindanao have evenly distributed rainfall of 900 mm annually, and varying temperature with an average range of 27-35°C annually (Cinco, Hilario, de Guzman, & Ares, 2013). Cavendish bananas occupy 84,000 hectares of agricultural land and produced 4.5 million metric tonnes of fruit in 2014 (Figure 4) (Antig, 2015). From 2000 to 2012, the Cavendish banana industry posted an average growth rate of 5.3% in terms of export volume (FAO, 2014). The growth was attributed to development of new plantations in response to the increasing demand of the international market. An overview of the market is presented in the next section.

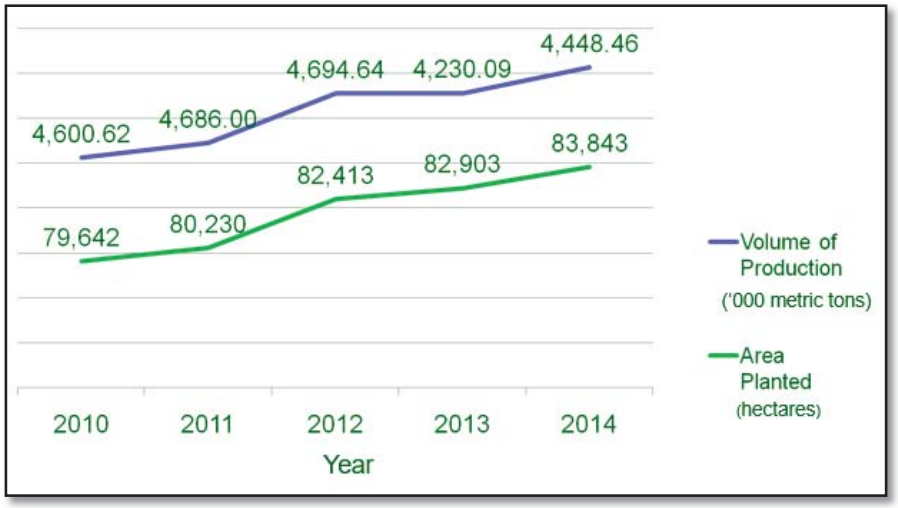


Figure 4. The area planted with Cavendish bananas against the volume of production from 2010–2014 (Antig, 2015).

2.3.1 The Cavendish Banana in the International Market

The Cavendish banana is the leading fresh fruit in the global agricultural export with regard to value and volume (FAO, 2015b). It is produced from "low income food deficit [tropical] countries" and exported to developed countries (Arias et al., 2003, p. 1). In 2011, India was the biggest producer of bananas, mainly the Cavendish type, followed by China, the Philippines, Brazil, Ecuador and Indonesia (FAO, 2015c). Among these large producers, Ecuador and the Philippines were the only exporters of Cavendish bananas. Cavendish bananas produced from the other four countries were sold locally for domestic consumption

(Arias et al., 2003). The United States and members of the European Union are the largest importers of bananas, each having 27% of the 16.2 million tonnes of global trade with an estimated value of US$ 11.7 billion in 2012 (FAO, 2014; ITC, 2015).

In 2011, the largest exporter of Cavendish bananas was Ecuador with 5,391.9 million tonnes followed by the Philippines, Columbia, Costa Rica and Guatemala (FAO, 2014). Due to its geographic proximity, Latin American producers dominated the United States and European markets, while the Philippines has dominated the Asian markets, specifically Japan, China, Iran and Korea (FAO, 2014). Other competing countries are Panama, Honduras, Columbia and Taiwan (PBGEA, 2015). With increasing market competition, the Philippine banana industry needs to improve production practices to meet export requirements and remain competitive in the international market. A typical production system for the Cavendish banana is presented in the next section.

2.3.2 Production Systems

The continuous monoculture production systems of Cavendish bananas are broadly categorised into highland or lowland production (Dizon, 2014). Most Cavendish bananas are produced in the lowland areas at 0-500 metres above sea level, while some other bananas are produced in the highlands greater than 500 metres above sea level. The differences in altitude provide varying agroecological conditions that affect banana production. The lowland plantations are generally humid, have a high amount of rainfall, and an average temperature of 27^{o}C, as opposed to the highland plantations that are generally less humid, and have a lower amount of rainfall and cooler temperature at an average of 18^{o}C (Colinet & Dejarme-Calalang, 2014). The lowland areas have higher pest and disease pressure than the highland areas because of the favourable agroecological conditions to support the growth of insects and pathogens. However, the agroecological conditions in the lowlands speed up the crop metabolism, which allows a shorter harvest cycle of 10-13 weeks as opposed to 18-20 weeks in the highlands (Dizon, 2014; Singh et al., 2002). Although the appearance of highland and lowland bananas look the same, the former is sweeter and has a stronger flavour than the latter (Dizon, 2014). Figure 5 shows the typical agronomic characteristics and parts of a bunch of Cavendish bananas.

Agronomic Characters	Cavendish
Plant height (cm)	214
Pseudostem girth (cm)	45
Days to flowering	213
Days to harvest	307
Days from flowering to harvest	93
Bunch weight (kg)	23
Number of hands per bunch	8
Number of fruits per bunch	128
Fruit weight (g)	88
Fruit length (mm)	140
Fruit width (mm)	32
Fruit thickness (mm)	30
Fruit shape	curved
Mature fruit peel color	yellow
Flesh weight (g)	61
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	69
Predominant taste	sweet
Pulp TSS (°Brix)	21

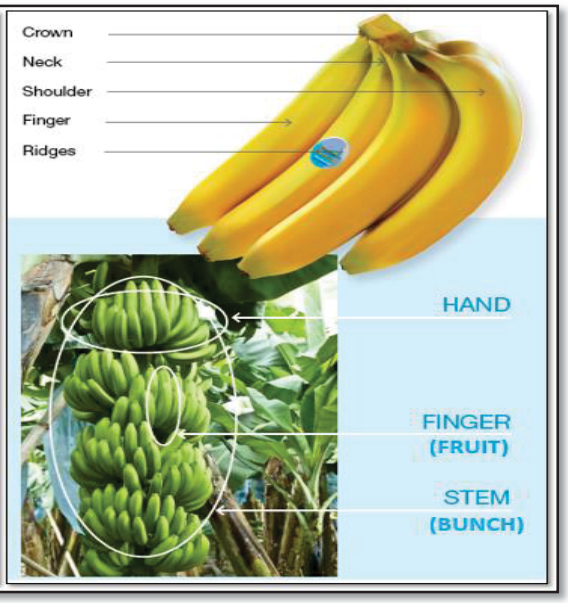


Figure 5. Typical agronomic characteristics and parts of a bunch of Cavendish bananas (Dela Cruz et al., 2008; Dole New Zealand, 2015).

To meet the food safety and quality requirements of the export markets, bananas are meticulously inspected at every stage of production from the selection of the planting material until they reach the consumer (Dizon, 2014). At the planting stage, materials are taken from either cultured tissues or carefully managed suckers. The former guarantees the purity of the banana while the latter warrants a healthy mother plant later on. At the middle of the cropping season, bananas are judiciously treated with fertilisers to improve plant nutrition and pesticides to protect against damaging organisms. Lowland bananas have about 40-45 pesticide applications per year due to higher pest and disease pressure than in the highlands (Singh et al., 2002). For fruit development, chemically impregnated polyethylene sheets are used to cover the entire banana bunch to protect them from biotic and abiotic stresses that could adversely affect the fruit quality and marketability. Upon harvest, bunches of green lowland bananas are brought to the packing facility by cranes or a mobile packing station in the highlands to minimise damage during handling (Figure 6) (Singh et al., 2002). Inside this facility, bananas are graded for appearance, size and maturity indexes (Figure 7). Thereafter, banana crowns are taken from the stem, cut into clusters of 4-9 fingers and placed inside a washing pool. Clusters of banana fingers are washed with running food grade chlorinated water and post-harvest fungicide solutions to remove the latex and prevent the development of blemishes on the peel, respectively (Figure 8). For food safety purposes, a few samples are routinely collected for chemical residue analysis. Then the washed bananas are weighed, labelled and wrapped in a thinly aerated primary polyethylene bag with a protective pad to avoid banana fingers from scratching one another while in transport (Figure 9). A group of clusters are placed in a secondary polyethylene bag with additional protective pads and put altogether in one box. Prior to sealing with a rubber band, the

secondary polyethylene bag is folded up and sucked by a vacuum to create a modified environment (Figure 10). The condition increases the storage stability and reduces post-harvest pathogenic infections (Dole New Zealand, 2015). Each box weighs approximately 13-18 kg depending on the customer's requirements (PBGEA, 2015).

Figure 6. Bunch of Cavendish bananas at the packing facility (Author, 2010).

Figure 7. Grading and checking of the maturity index of Cavendish bananas (Author, 2010).

Figure 8. Cluster of banana fingers in a pool with running food grade chlorinated water (Author, 2010).

Figure 9. Clusters of bananas with protected pad ready for packing (Author, 2010).

Figure 10. A box of Cavendish bananas in a vacuum pack weighing 13-18 kg (Author, 2010).

2.3.3 Minimum Quality Requirements for the Export of Cavendish Bananas

In accordance with the Philippine government's commitment to the International Plant Protection Convention and the World Trade Organization – Sanitary and Phytosanitary Agreement, the BPI-Plant Quarantine Services (BPI-PQS) inspects the banana plantations to ensure that the minimum export quality requirements are met (Barron, 2012). However, the inspection is limited only to the period when the fruit is harvested, processed, packed and then loaded into the shipping containers. BPI-PQS provide a phytosanitary certificate to the exporter stating that the products were inspected according to an internationally agreed procedure.

At the packing facility, inspectors check at least 5% of the shipment randomly for the presence of scale insects, mealy bugs and other insects. If there are detections at 5%, the crop is re-sampled at 10%. If there are further detections, the bananas are initially rejected for export because of the zero tolerance policy for insect pests. Other minimum requirements include that the banana fingers are a whole green colour, sound, practically free of visible foreign matter, free of abnormal appearance due to pest damage, free of external moisture, free of any foreign smells or tastes, must be firm, free of damage from cold temperatures, practically free of bruises, free of deformed curvature of fingers and with crowns intact without bending, desiccation or fungal damage (Codex Alimentarius, 2005). Bananas of superior quality are graded as "Extra" class, while those with slight defects on the fingers are graded as Class I, and those that meet the minimum requirements are graded as Class II (Codex Alimentarius, 2005). However, industry players refer to Class I and II as Class A and B, respectively. If the bananas do not meet the pest-free requirements, bananas are sent back to the packing facility for reprocessing. However, this entails an opportunity cost, and can potentially reduce the grading quality of the bananas. Bananas that do not meet the minimum export requirements are rejected for export, disposed of locally or processed as feed.

Despite the routine inspections, the banana industry still faces a series of rejections in export markets by the receiving country's plant quarantine regulators and these rejections became prevalent in 2012. The grounds for rejection include: the incidence of mealy bugs *(Dysmicoccus brevipes)* and scale insects *(Aspidiotus destrcuctor),* and the detection of residue levels that exceed the residue limits of pesticide products on the harvested fruit. Because of this change in the international markets, the BPI issued Memorandum Order No. 40, a mandatory public regulation that outlines the guidelines for the accreditation of growers, exporters, traders and packing facilities involved in fruit and vegetable export operations (Appendix 1). A separate mandatory regulation, Memorandum Order No. 41, had been issued by the BPI that specifically targeted the different actors associated with the banana plantations. These actors, at least as regards the Cavendish banana industry, are described in the following section.

2.3.4 Actors in the Cavendish Banana Industry

The BPI Memorandum Order No. 41 outlines the specific responsibilities of BPI-Plant Quarantine Services (PQS), banana growers, traders and exporters, and packing facilities (Appendix 2). BPI-PQS is responsible for the mandatory accreditation of banana growers, packing facilities, traders and exporters through the evaluation of different documents and field inspection of their facilities and practices. They provide a unique license number for each grower's production sites, packing facility, trader and exporter. Accredited stakeholders use the license number for each transaction to track the movement of the bananas

from the grower to the consumer. Each box of bananas has a label that contains the unique license number for traceability purposes.

To be accredited, applicants are required to submit a set of documents depending on the type of accreditation being applied for as listed in Appendix 1. Figure 11 shows a simple model illustrating the relationship of the different groups of stakeholders in the banana export industry. Transactions between and within stakeholders are governed by a contract or supply agreement.

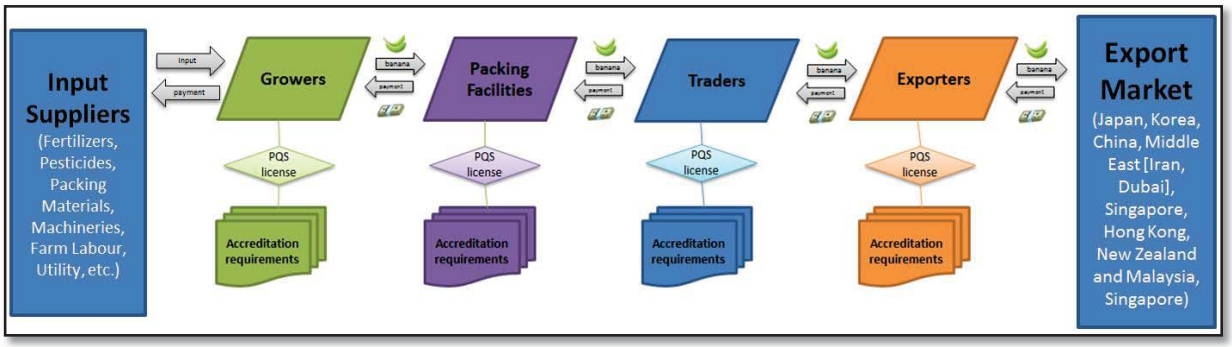


Figure 11. Simple model showing the relationship of different groups of stakeholders in the banana export industry.

The "growers" can be a corporation, cooperative or small-to-medium-scale growers. The corporate growers are companies that own and/or manage a large area of banana plantations. Cooperative growers are groups of either individual farmers or individual workers or a combination of both farmers and workers. The small-to-medium-scale growers are landowners who cultivate bananas on their own farm. There are no strict criteria about the size of the operations among the corporate and cooperative growers, but the small-to-medium-scale growers have a land area ranging from 0.2 to 100 hectares (NLDF, 2013). For the accreditation of banana growers, the memorandum requires a community tax certificate and information about the production area including proof of ownership, site location, production area and yield capacity. In addition, the owner, farm manager or quality assurance staff member responsible for quality control is required to provide a certificate to show that they have been trained in GAP by the BPI-Plant Quarantine Services. The training covers GAP designed to ensure the product quality of bananas. However, the *PhilGAP* certification programme is not covered in these training modules.

Most banana growers have their own packing facilities, and these need to be accredited according to the memorandum. As an accredited facility, it should provide an acceptable disposal system for rejected fruit, and disinfestation, pest management and sanitation programmes. Specifically, the facility must have two wash tanks with an adequate amount of clean water, sufficient lighting, a well-maintained storage area,

and conveyor lines provided with high-pressurised water sprays and blowers or dryers to ensure that the packed bananas are pest-free.

In situations where growers do not have the capacity to market the bananas, there are middlemen or traders who link the growers to the market or institutional buyers who have access to the international market. Traders buy bananas from the growers and sell these to exporters. They utilise their knowledge of the different processes in the supply chain and their networks within government and other service sectors. On the other hand, institutional buyers are large multinational agricultural producers and exporters such as Del Monte, Dole, Sumifru and Unifrutti. They can either lease land from landowers to manage the plantation or buy bananas from contracted growers who can meet their quality requirements. A contract growing arrangement is when a growers enters into supply agreement with an institutional buyer at a predetermined price for the production and supply of agricultural products for a certain period of years (Digal, 2007). Growers are expected to have the facilities needed to produce the bananas, but the institutional buyers are expected to provide technical assistance to the growers to meet certain quality requirements.

Lastly, the exporters are involved in the selling of bananas on the international market. In some instances, the trader and exporter are the same company. In a few situations, institutional buyers can be a grower with their own packing facilities who are involved in trading and exporting bananas. As such, they have a greater capacity to control banana prices at the farm gate. Nonetheless, both traders and exporters need to ensure compliance with GAP standards from their respective packing facilities and growers. As of September 2016, the Davao region had recorded 752 accredited growers covering up to 45,000 hectares, 513 accredited packing facilities, 35 accredited traders and 175 accredited exporters (PQS, 2016).

Other private actors in the Cavendish banana industry that are not covered by the memorandum are the suppliers of farm inputs such as fertilisers, pesticides, packing materials, machinery, etc, and service providers such as farm labour and utility providers. However, it is the the grower’s responsibility to scrutinise their respective input suppliers. In some cases, the traders can also deploy workers to a grower’s plantation for technical or operational assistance, and can extend financial assistance to growers because of the high cost of insfrastructure and production inputs. Additionally, other government actors include the local government units (LGUs) that check the plantation’s local operations, and other regulatory agencies such as the Department of Environment and Natural Resources (DENR), the Department of Labour and Emploment (DOLE), etc. In addition, there are also non-government organisations (NGOs) who are either antagonistic to, or supportive of, the industry.

2.4 Summary

The Philippines is an archipelago country in Southeast Asia situated in the West Pacific Ocean. It has three main geographic locations from north to south, namely: Luzon, Visayas and Mindanao. Luzon Island contains the capital city of Manila, where all the national government offices are located.

The Department of Agriculture is the main government agency that runs the operations of the Philippine agriculture sector. This sector plays a vital role in the Philippines as the primary source of food and raw materials for different industry and service sectors. It is also engaged in agricultural exports such as coconut and fresh Cavendish bananas. The country used to be an agricultural economy until the agricultural sector's declining contribution to the country's GDP over the years. There are several production, environmental and institutional challenges that have contributed to the slow growth of the agriculture sector, including the banana industry.

Cavendish bananas are the leading export crop in terms of value and volume in the Philippines. It is grown extensively in the island of Mindanao through a continuous monoculture production in both the lowland and highland areas. The production systems are designed to meet export quality requirements and are routinely inspected by the BPI-Plant Quarantine Services (PQS) prior to export. However, in 2012, a number of transactions have failed to meet the international market's quality requirements and were rejected in the export markets. The problem was because of the detection of mealy bugs and scale insects or because chemical residues exceeded the specified limits. In order to address the situation, the BPI-PQS introduced a mandatory accreditation scheme to banana growers, packing facilities, traders and exporters. In order to be accredited, the applicants need to submit different sets of documents including proof of training in GAP. Then, the facilities are inspected during the harvesting to packaging periods only. Audit and inspection during the production operations are not covered by the scheme. Likewise, although the GAP training is designed to ensure the product quality of bananas, it does not cover the *PhilGAP* certification programme in the training modules.

Chapter 3: LITERATURE REVIEW

3.1 Introduction

Banzon et al. (2013a) conducted a study in 2011 to identify the issues related to the adoption of the *PhilGAP* certification programme by Cavendish banana plantations. They identified key barriers to, and drivers of, adoption and then suggested subsequent policy recommendations to improve the programme. However, the number of banana plantations that have adopted the *PhilGAP* certification scheme five years later remains the same. This study was initiated to revisit and reinvestigate the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme. This case study seeks to address the following questions: (1) Do the same barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations identified by Banzon et al. (2013a) still exist or have new drivers and barriers emerged since the initial study in 2011?; (2) How have these barriers continued to limit the adoption of, or how have these drivers led to the adoption of, the *PhilGAP* certification programme by Cavendish banana plantations in the Philippines?; and (3) Why do some Cavendish banana plantations adopt and continue to participate in the *PhilGAP* certification programme despite these barriers?

This chapter reviews the relevant literature for this research. Although there is an increasing influence of GAP in the international and local markets, there are limited research studies on its adoption and certification programme (Schreinemachers et al., 2012) and much less in relation to bananas. As such, this review will focus on adoption studies conducted on public and private GAP programmes not only in relation to bananas but also other crops. This chapter has been divided into seven main sections. Section 3.2 provides an overview of GAP and the QMS in the agricultural food chain and Section 3.3 discusses the adoption process. Sections 3.4 and 3.5 discuss the barriers to, and drivers of, the adoption of public GAP programmes, respectively. Section 3.6 provides a review of the different motivations for adopting private GAP programmes. Finally, Section 3.7 provides the summary for this chapter.

3.2 Good Agricultural Practices (GAP) and an Overview of the Quality Management System (QMS)

PhilGAP is a type of GAP programme and, as such, it is important to understand how GAP is defined in the literature. GAP is generally defined as "the application of available knowledge to addressing environmental, economic and social sustainability for on-farm production and post-production processes resulting in safe and healthy food and non-food agricultural products" (FAO, 2003, p. 1). Congruent to FAO's (2003) definition, GAP is also defined as the programmes that "set standards of production (i.e. minimum tillage, intercropping, crop rotation, IPM [Integrated Pest Management] methods, composts, mulches, cover crops, chemical storage, recording, and worker safety and health) that optimally utilize

farming inputs or resources in a sustainable manner" (Rajendran et al., 2016, pp. 2272-2273). This definition will be adapted in this research as a "generic GAP" from this point onward. A generic GAP focuses only at the farm level, and does not include the food value chain. However, GAP is an extensive programme that contains different actors in the food chain and this is explored as a regulatory framework to address the issues of food quality and safety (Burrell, 2011; Gereffi & Lee, 2009). The food chain approach covers all processes of production, distribution and consumption that create food as an end-product (Burrell, 2011). Ideally, the framework ensures a reduction in pesticide usage, sustainable utilisation of natural resources and the promotion of occupational health and safety for farm workers and communities (Gereffi & Lee, 2009). However, this is not always the case. Debates arise in the literature when the concept of GAP is used in regulating production practices to achieve certain quality requirements. As such, the following section explains how quality is defined in the literature.

3.2.1 Definition of Quality and Quality Management System (QMS)

The term quality refers to "a wide-range of criteria and properties, all contested locally, nationally and globally [by different people]" (Goodman & Watts, 1997, p. 19). It is a complex term carrying a vast range of meanings used and defined by different groups of actors within the agri-food system (Morris, 2000). To agricultural producers, quality is used as a set of product specifications to either attract or maintain a stable relationship with buyers (Ilbery & Kneafsey, 2000). From the consumer's perspective, quality refers to a personal preference for taste, texture and appearance as well as concerns for food safety and satisfaction (Ilbery & Kneafsey, 1998; Vastoia, 1997). From a regulatory institution's standpoint, quality refers to the "objective" measures such as the shelf-life extension of the product, the application of sanitary and phytosanitary practices, and environmental protection (Shahbaz, Akram, Ahn, & Kwon, 2016). Yet, the objective nature of the measures varies according to the "political and economic pressures, scientific understanding, and cultural contexts" and is therefore "socially constructed" by the governing institutions (Ilbery & Kneafsey, 2000, p. 218). It also follows that the concept of quality is "constantly created and re-created through the discourses and actions of key actors within the agri-food system" (Morris & Young, 2000, p. 104), and for this reason, Morris (2000, p. 435) argued that quality in itself is "a social construct".

The term quality can also refer to a "bundle of certain attributes" such as safety, nutrition, value, packaging and processes that are relevant to the different actors in the supply chain (Caswell, Bredahl, & Hooker, 1998; Sterns, Codron, & Reardon, 2001, p. 3). However, the typologies of these attributes are not well-defined or not clearly understood in the literature despite their increasing significance in the agri-food chain (Sterns et al., 2001). To provide a better understanding about the concept of quality in the agri-

food chain, Caswell et al. (1998, p. 548) introduced the food "quality metasystems" in the literature as "strategies that affect any of the quality attributes", and this is defined further in the next paragraph.

Metasystems are characterised by the documentation, audit and implementation of agreed production practices or processes to ensure food quality (Caswell et al., 1998). However, different authors in the literature have used different terms to mean the same characteristics of a metasystem. Morris (2000, p. 433) adopted the term quality assurance scheme, which means "the use of systems which ensure that a food product meets a particular set of standards or quality criteria in relation to both the nature of the product itself and to the processes of production, distribution and processing". Likewise, the secretariat of the Codex Alimentarius Commission of the United Nations used the term quality assurance as a "means of all those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality" (Secretariat, 2016, p. 211). In addition, Morris and Young (2000) employed the terms quality assurance and farm assurance interchangeably to describe the characteristics of a metasystem, although the former focuses on the entire process while the latter focuses more on the production practices only. Likewise, Nadvi and Wältring (2002) used the terms quality assurance system and quality management system alternately when referring to the standards used to ensure the quality of food products. Noelke and Caswell (2000, p. 5) viewed the quality management system as a system to "control the quality of the product as determined by an array of individual attributes the product possesses, with the goal of meeting agreed-upon requirements [or standards]". Similarly, Banzon et al. (2013a) and Lockie et al. (2014) used the term quality management system when referring to the GAP programmes used on Cavendish banana plantations. For consistency and clarity purposes, quality management system (QMS) will be the term used in this research from here on, as a system which ensures that quality standards are met in relation to the nature of the food product itself and to the processes of production and processing. QMS programmes can be private where they are managed and coordinated by a private organisation or they can be public where the government is responsible for their design and implementation (Henson & Humphrey, 2010). *PhilGAP* is a public QMS and, as such, it is a GAP programme coordinated by the Philippine government. The following section reviews the literature on public versus private GAP programmes.

3.2.2 Public vs Private GAP Programmes

A GAP programme refers to the set of procedures, processes or regulations that will be undertaken to ensure the desired product quality standards (Srisopaporn, Jourdain, Perret, & Shivakoti, 2015). The standards are a set of agreed rules or criteria intended to measure products, practices, performance levels or detailed characteristics of a product, and the processes used to produce a product (Nadvi & Wältring, 2002). Standards provide a universal language of measurements to categorise and classify things in order

to create equivalences or uniformities that cut across time and space (Bain, Ransom, & Higgins, 2013). Standardisation is a 'strict' process by which a standard is set (Tay & Parker, 1990, p. 73). Various actors and institutions set the standards to establish the norms of products, people and processes despite the differences that lie among cultures, markets and political boundaries (Busch, 2000).

GAP programmes are created to provide greater quality control of the product itself and the activities associated with the production, processing and distribution of the product in a globalised environment (Nadvi & Wältring, 2002). However, the proliferation of public and private programmes governing public and private standards has created confusion in the food supply chain (Bain et al., 2013; Fulponi, 2006; Gunningham & Rees, 1997; Raymond & Bonnaud, 2014; Vandemoortele & Deconinck, 2014). Public GAP programmes have standards developed by government institutions while private GAP programmes are developed by private institutions or NGOs (Bain et al., 2013). National standards are often harmonised with *GlobalGAP* in order to facilitate market access or maintain existing international markets, especially in Europe (Amekawa, 2016, p. 535; Lockie, McNaughton, Thompson, & Tennent, 2013; Nabeshima et al., 2015). Harmonisation is a "less strict" process by which less diversity is attained when a uniform standard cannot be set, thus standards are not necessarily equivalent (Tay & Parker, 1990, p. 73). As such, the implementation of practices and audit processes, as well as the focus of the implementing agency, differ from that of *GlobalGAP* because of its context-dependent implementation (Amekawa, 2009; Schreinemachers et al., 2012). In contrast, private sectors in different countries created a localised version of GAP standards such as *JapanGAP*, *NZGAP*, *ChileGAP* and *KenyaGAP* to address specific country requirements and they benchmark these standards with *GlobalGAP* (Amekawa, 2009; Nabeshima et al., 2015). Benchmarking is the process by which the *GlobalGAP* certification committee compares the standards of an existing QMS to that of the *GlobalGAP* standards to prove they have equivalent protocols and regulations (Amekawa, 2009).

Gunningham and Rees (1997) argued that there is no dichotomy between public and private standards as a matter of regulation, but it is rather a continuum of regulations in which public and private regulations are at the opposite ends. Gunningham and Rees (1997) argued further that public GAP programmes are the bare minimum standard, with private GAP programmes going beyond that. Thus, both public and private GAP programmes can co-exist and be practised by a single entity at the same time. In contrast, Raymond and Bonnaud (2014) argued that some people often view public and private GAP programmes as antagonistic to one another. The public GAP programmes are usually inefficient, lack sanctions and cannot fully deliver their promises while private GAP programmes are routinely efficient, relevant and appropriate to the private norms (Raymond & Bonnaud, 2014). A weakness of public GAP programmes is that their auditing systems lack credibility with retailers or wholesalers (Sarsud, 2007; Wongprawmas,

Canavari, & Waisarayutt, 2015). In contrast, Vandemoortele and Deconinck (2014) argued that the strength of private standards is that they are generally more stringent than the public standards and that private standards command stronger market power whereas the public standards are weak.

Keeping a multiple set of QMS programmes with often conflicting management and reporting requirements implies a spectrum of financial and other costs on farmers and other actors in the agricultural food supply chain (Lockie et al., 2014). In countries where both public and private GAP programmes operate, the public-private interdependence created competing requirements at the national and international levels that are concealed by the language of benchmarking and harmonisation (Lockie et al., 2014). The situation leaves an avenue for contestation and interpretation of the international standards into the local context resulting in a hybrid, collaborative or co-regulated environment (Aasprong, 2013; Lockie et al., 2013). However, Lockie et al. (2013) argued that the interdependence between *GlobalGAP* and localised GAP standards means that neither the standards themselves nor the products being certified are internationally uniform.

Standards in general, not just the GAP standards, can also be public and private and are distinguished as either voluntary or mandatory (Henson & Humphrey, 2010; Raymond & Bonnaud, 2014). Not all standards developed by the government are mandatory, just as not all private standards are voluntary. The government may enact both voluntary compliance of public standards or mandatory compliance of private standards resulting in four possible amalgamations of public or private and mandatory or voluntary standards (Table 1) (Henson & Humphrey, 2010). Compliance to *PhilGAP* standards are validated through a certification process. The following section presents a typical certification process.

3.2.3 Typical Certification Process and the Different Generations of Standards

A certification is a process by which compliance for a certain set of standards is validated through audit and inspection (Henson & Humphrey, 2010). In this process, rules and regulations are set in written form for the initial establishment and viable operation of the standards. Then an entity decides to adopt the standards or put them into practice. After the decision has been made, the entity applies the procedures or practices in order to meet the standards. Then compliance to the implementation of the standards is assessed or verified through documented evidence. Lastly, non-compliance to the agreed standards will be penalised or given corrective actions. Following the functions listed in Table 1, a public standard can be mandatory or voluntary, and that regulation is codified into law through legislation, and then applied by a government regulatory agency to private firms through inspection and audit activities. However, non-compliance to the mandatory public standards entails a criminal or administrative offence, while non-compliance to the voluntary public standards entails penalties or corrective actions set by the certification

body (Henson & Humphrey, 2010). In addition, a private institution develops a set of standards, which are legally mandated by the government as a mandatory standard (Nadvi & Wältring, 2002). Lastly, voluntary private standards are standards developed and adopted by private organisations (Fulponi, 2006; Havinga, 2008; Raymond & Bonnaud, 2014). *PhilGAP* follows a public voluntary certification process.

Table 1. Mix of functions associated with amalgamated standards (Henson & Humphrey, 2010).

Functions	**Public Mandatory Standards**	**Public Voluntary Standards**	**Legally-Mandated Private Standards**	**Voluntary Private Standards**
Standard setting	Legislature and/ or public regulator	Legislature and/ or public regulator	Commercial or non-commercial private body	Commercial or non-commercial private body
Adoption	Legislature and/ or public regulator	Legislature and/ or public regulator, private firms or organisations	Legislature and/ or public regulator	Private firms or organisations
Implementation	Private firms	Private firms	Private firms	Private firms
Conformity Assessment	Official inspectorate	Public/private auditor	Private auditor	Private auditor
Enforcement	Criminal or administrative courts	Public/private certification body	Criminal or administrative courts	Private certification body

There are a number of quality management standards in the agri-food chain that can be categorised into any of three types or generations, with 'generic' as the first, followed by 'sector-specific' and lastly 'company-based' standards (Nadvi & Wältring, 2002, p. 10). The International Organisation for Standardization (ISO), an NGO, developed a generic standard called *ISO 9000: Quality Management*, in 1987 through the national standardisation bodies of different member countries, in consultation with extensive business groups from industrialised countries and different accredited certification bodies (Nadvi & Wältring, 2002). As a first generation or generic standard, *ISO 9000* ensures that a product or service consistently meets the required standards set by the company through quality management procedures, and it applies to a wide range of industries including manufacturing, services and even in public sector processes (Nadvi & Wältring, 2002). It is one of the standards legally mandated by other public sectors as a *de facto* requirement in various markets (Nadvi & Wältring, 2002). Riding on the popularity of *ISO 9000*, the same organisation introduced *ISO 14000* to cover environmental management

systems employed by various industries (Corbett & Kirsch, 2001). ISO standards are characterised by the documentation and implementation of quality management practices, but neither prescribe specific practices or specify directly the quality or environmental practices relevant to the creation of the product or service (Corbett & Kirsch, 2001; Fulponi, 2006). An ISO standard is used to ensure consistency of products or services by checking the entity to "say what you do, and do what you say" (Corbett & Kirsch, 2001, p. 328).

A second generation standard has emerged in the food and agriculture sector through the development of the *European Retailer Produce Working Group* (*EurepGAP*) (Nadvi & Wältring, 2002). *EurepGAP* was formed to develop and harmonise the production protocols for fruit and vegetable growers in Europe in 1997 (Burrell, 2011). *EurepGAP* also served as a private governing body to audit the producers of fruit and vegetables (Raymond & Bonnaud, 2014). The process ensures the production of high quality and safe food that is required by consumers (Kalfagianni & Fuchs, 2012). However, the concept of *EurepGAP* has continued to evolve over time and extended to greater geographical boundaries in response to the fast changing and globally expanding food trade (Raymond & Bonnaud, 2014). Since its inception, it has included the protocols to upgrade food quality, environmental sustainability and social accountability (Kalfagianni & Fuchs, 2012). *EurepGAP* then changed its name to *GlobalGAP* in 2007 in order to reflect its expanding role in establishing GAP standards that are benchmarked by several international retailers, and harmonised by different government regulatory agencies (Burrell, 2011; Valk & Roest, 2009).

In the *GlobalGAP* certification programme, the product attributes come as a checklist of documents containing the critical control points and compliance criteria (CPCC) (Kalfagianni & Fuchs, 2012). The CPCC provides a range of standards that ought to be complied with by the producers and audited by the *GlobalGAP* certifying body to verify compliance. The control points are management areas for compliance and range from: (1) record-keeping; (2) internal self-assessment; (3) site history and site management; (4) waste and pollution management; (5) workers' health and safety welfare; (6) recycling and re-use of resources; (7) environment and conservation; and (8) complaints and traceability (Kalfagianni & Fuchs, 2012). The CPCC is comprised of 254 questions and categorised into four modules, namely: (1) Food Safety, (2) Environmental Sustainability, (3) Workers' Health and (4) Animal Welfare (Amekawa, 2009; Kalfagianni & Fuchs, 2012). Each module is divided into criteria with a corresponding level of compliance, namely: 'Major Must', 'Minor Must' and 'Recommendation'. In order to obtain a *GlobalGAP* certificate, at least 95% compliance is needed for 'Minor Must' and 100% compliance is required for 'Major Must', while compliance to the 'Recommendation' criteria is optional (Amekawa, 2009). The *PhilGAP* certification programme is harmonised from the *GlobalGAP* (Banzon et al., 2013a) and, as such, it has a 'less strict' process (Tay & Parker, 1990).

A third generation of food standards has emerged from powerful transnational supermarket companies or retailers who can command company-based standards (Nadvi & Wältring, 2002). These are the company-based or "individual firm standards", which are communicated by the large supermarket companies or retailers across their suppliers as a sub-brand of their own product in the label (Henson & Humphrey, 2010, p. 1632). Depending on the supply agreement, the retailers perform direct inspections and audits to the producers' production facilities. Compliance to these standards can be viewed as a new technology intended for adoption. As such, it is important to understand how the term technology is defined in the literature and this is reviewed in the next section.

3.2.4 Definition of Technology

In some studies, technology and innovation are used synonymously when a product or a practice is perceived as something new (Jacobsson & Johnson, 2000; Rogers, 2003; Sunding & Zilberman, 2001). The *PhilGAP* certification programme is still in the "infancy stage" and it is perceived as something new (Banzon et al., 2013a, p. 2). For this reason, the terms technology and innovation will likewise be used synonymously in this review. A technology is defined as "the design for instrumental action that reduces the uncertainty in the cause-effect relationship involved in achieving a desired outcome" (Rogers, 2003, p. 13). There are different types of technologies that are classified as labour-saving or labour-intensive, or capital-saving or capital-intensive, technologies (Feder, Just, & Zilberman, 1985; Zepeda, 1990). A labour-saving technology requires less labour input and is highly promoted when there is labour shortage or the labour cost is high (Feder et al., 1985). In contrast, a labour-intensive technology requires more labour input such as a high yielding variety because of the additional requirement for fertiliser and pesticide applications (Feder et al., 1985). A capital-intensive technology requires a high investment cost while a capital-saving technology does not (Feder et al., 1985; Zepeda, 1990). The *PhilGAP* certification programme is a labour and capital-intensive technology. As such, it is perceived as more complicated and tends to have a slow rate of adoption (Rogers, 2003).

In addition, a technology may also be classified according to the scale of operation as dependent or neutral (Abramovitz, 1986; Just, Zilberman, & Rausser, 1980). Scale-dependent technologies depends on the size of the operation and require a large amount of investment, while a scale-neutral technology is not affected by the size of the operation. Large-scale technologies are often supported by a large, prosperous and rapidly-growing population with "striking homogeneity of tastes" (Abramovitz, 1986, p. 397). Scale-neutral technologies include practices that are related to food safety and environmental protection (Marine, Martin, Adalja, Mathew, & Everts, 2016). A generic GAP is what Rogers (2003, p. 14) calls a "technology cluster", which is comprised of a broad range of practices with associated inputs. The

intended user of the technology can adopt at least one of the complementary components because the practices in each component are treated independently (Feder et al., 1985). As such, there can be different situations in the technology adoption process that may take place instantaneously because of the differences in the practices (Feder et al., 1985). On the other hand, the *PhilGAP* certification programme is an audit system of these practices and is viewed as a whole package of technology. The following section discusses the technology adoption process.

3.3 The Adoption Process

The adoption process is defined from Rogers' (2003, p. 20) innovation-decision process model, in which "an individual (or other decision-making unit) passes from the first knowledge of an innovation, to the formation of an attitude toward the innovation, to a decision to adopt or reject, to implementation and use of the new idea, and to confirmation of this decision". In this process, innovations are diffused through the communication of information in social systems (Rogers, 2003). Rogers (2003) highlighted the role of mass media and interpersonal communications in the different stages of the innovation-decision process, namely: (1) Knowledge; (2) Persuasion; (3) Decision; (4) Implementation; and (5) Confirmation (Figure 12).

Since the inception of Rogers' innovation-diffusion model in the 1960s, many empirical studies have used and tested the model (Klerkx, van Mierlo, & Leeuwis, 2012). Padel (2001) used the model to investigate the conversion from traditional farming practices to organic farming in Europe. Likewise, Röling (2009) argued that the success of the green revolution technology in Asia was attributed to the promotion of this technology following the innovation-diffusion approach. In addition, the model is also useful in crisis situations, such as the emergence of invasive pests or diseases or in relation to issues that need significant inputs of technical expertise, e.g. the development of genetically modified organisms (Sassenrath et al., 2008). However, the innovation-diffusion model was criticised for being reductionist, linear and lacking in feedback mechanisms (Norman, 2002). The farmers were viewed at the receiving end of the innovation and labelled as either adopters or laggards. Some authors (e.g. Öhlmér, Olson, & Brehmer, 1998) argue that the linear progression from the knowledge to confirmation stage does not really apply in the real-life context because the process is uncertain, diverse and unpredictable.

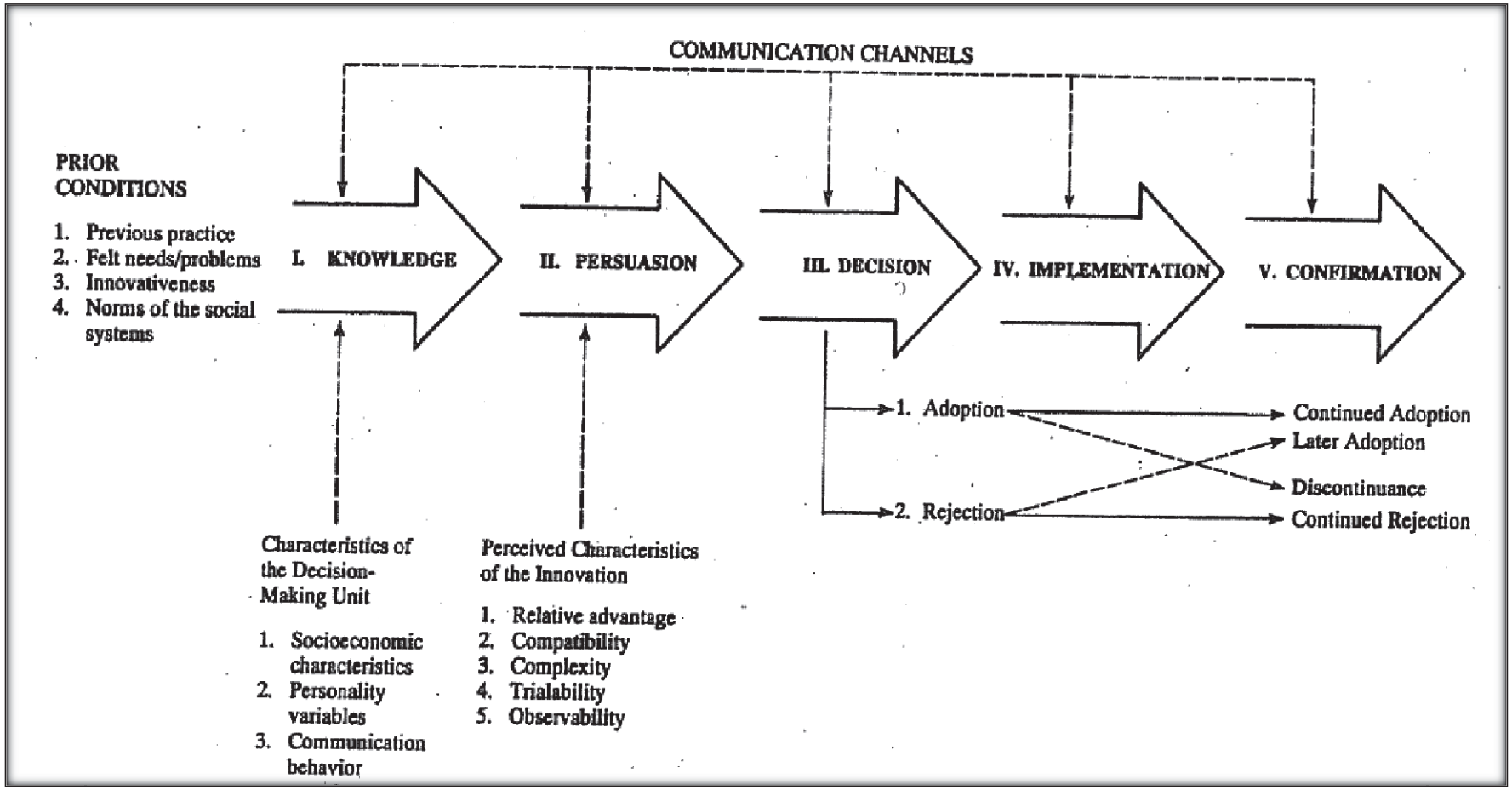


Figure 12. The innovation-decision process (Rogers, 2003, p. 170).

In 2012, Cavendish banana exports from the Philippines faced a crisis because of repeated rejection of produce because of either the presence of pests in the shipment or excessive pesticide residues (West, 2012). Food safety in the international market became a problematic situation for the Philippines' Cavendish banana plantations. For this reason, the Rogers' (2003) innovation-diffusion model can still be used, despite its criticisms, as a valuable tool for the structural analysis of the adoption process of the *PhilGAP* certification programme. The initial Banzon et al. (2013a) study of the adoption of GAP in the Philippines did not provide a framework for viewing the adoption process. Each stage in Rogers' (2003) adoption process has a rejection point and, as such, this lens provides insights into the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme. Each stage can either lead onto the next stage or it can stop if the grower rejects the technology at a rejection point. These stages and the empirical evidence of barriers to and drivers of adoption are discussed in the following sections.

3.3.1 Knowledge Stage

The knowledge stage, according to Rogers (2003, p. 171), is where farmers become aware of the innovation through either mass media or interpersonal communications. Rogers (2003) explained that farmers may develop selective exposure or selective perceptions against the innovation unless a need is felt to adopt the innovation. A selective exposure is the individual's tendency to go with communication messages that are aligned with the individual's existing beliefs, while a selective perception is a tendency to interpret these messages according to the individual's existing beliefs (Rogers, 2003). He further presented the different types of knowledge as: (1) awareness knowledge or information that tells the farmer about the existence of the innovation; (2) how-to knowledge or the process of how the innovation works; and (3) principles knowledge or the reasons why it works. Rogers (2003) further explained that the "early knowers" of the innovation are more educated, more cosmopolitan, more active in social activities, have higher social status, have more exposure to mass media and interpersonal channels, and have more contacts with change agents than the "late knowers". These are influenced by the socio-economic factors, personality differences, and communication behaviour in a social system (Rogers, 2003). However, there is limited research on the transition from ignorance to the awareness of the technology (Pannell et al., 2006).

Banzon et al. (2013a), in a study of the adoption of GAP by banana growers, found that a grower cooperative of the Cardava banana (a type of local banana) in the Philippines obtained knowledge about the *PhilGAP* certification programme through a seminar, years after the programme had been introduced. A non-government organisation (NGO) provided information about the *PhilGAP* certification programme that included the process and principles behind the programme. This farmer cooperative is considered an "early knower" of the programme for banana plantations through the support from the NGO. However, the same study found that the reason why most farmers did not

adopt the *PhilGAP* certification programme was because they were not aware of this new technology. Thus, the how-to and principles knowledge was irrelevant for these growers and hindered the adoption process. However, some farmers who had heard about *PhilGAP* did not seek further information and made their own interpretation on how a 'generic GAP' can be implemented (Banzon et al., 2013a).

Public GAP programmes in some countries were also criticised for the lack of promotion to create awareness and induce change in the mind-set of the rural community farmers (Robert & Menon, 2007; Wongprawmas et al., 2015). Studies have reported the characteristics of public GAP programmes are often not well communicated to the intended adopters (Robert & Menon, 2007; Wongprawmas et al., 2015). Robert and Menon (2007) reported that the Vietnam *VietGAP* certification programme adoption rate was low, especially for small-scale farmers, due to a lack of understanding of the process and principles behind the implementation of the programme. These farmers operated on a small-scale subsistence farming system and did not view farming as a business. The lack of understanding about the public GAP programme and its impact on their farming practices made these farmers less receptive to change. In contrast, Robert and Menon (2007) found that commercial farmers had more linkages to exporters or retailers and were more knowledgeable about changing farming practices to suit market requirements. Similarly, Wongprawmas et al. (2015) found that some producers who did not adopt Thailand's *QGAP* had a negative perception of it as a complicated and time-consuming endeavour because it entailed tedious record-keeping. Because of this negative perception they did not engage in the certification process – a form of selective exposure. In contrast, producers who had adopted *QGAP* understood how the practices were implemented and the reasons for implementing them.

Srisopaporn et al. (2015) found that knowledge of the *QGAP* programmes is affected by what Rogers (2003, p. 170) calls the "characteristics of the decision-making unit". These include: (1) human capital such as experience and education, and (2) social capital including information sources, membership in farmer groups, networks of farmer organisations adopting *QGAP*, training participation and assistance from government and NGOs. The study revealed that more educated and experienced rice farmers were more equipped to understand the principles behind *QGAP*. Frequent contact with reliable extension agents also hastened the adoption and continued participation in the programme. Although the more experienced rice farmers could understand the principles, they still evaluated whether or not *QGAP* would meet their needs to upgrade their operations. In addition, those farmers who discontinued adoption made informed decisions by comparing the increased labour costs associated with the programme against the reduction in chemical input costs. As such, the cognitive knowledge of an innovation does not necessarily translate to adoption. The knowledge needs to be affective to develop an attitude toward the innovation and this is discussed in the next section.

3.3.2 Persuasion Stage

The persuasion stage is where having obtained knowledge about the technology, farmers develop either a positive or negative perception about the innovation (Rogers, 2003, p. 174). He explained that an individual's attitude against or towards an innovation can be created by looking at the characteristics of the innovation such as relative advantage, complexity, compatibility, trialability and observability. Additionally, risks associated with the adoption also create either a positive or negative perception about the innovation (Batz, Peters, & Janssen, 1999). The initial Banzon et al. (2013a) study of the adoption of GAP in the Philippines in 2011 did not classify the growers' perceptions of the characteristics of the technology as specified by Rogers (2003). For this reason, the perceived characteristics of a technology are reviewed in the succeeding paragraphs.

Relative Advantage

Relative advantage refers to the perceived additional benefit of an innovation that is better than the idea or product it supersedes (Rogers, 2003). The degree of relative advantage can be measured in terms of economic advantage, personal convenience and satisfaction or social prestige that comes with the adoption of an innovation (Rogers, 2003). For example, Banzon et al. (2013a) reported that the adoption of a GAP certification programme for bananas, regardless of whether it was a public or private programme, was perceived by growers to provide economic advantage because of improved market access to international markets relative to non-GAP-certified farms. However, the technology had a number of economic advantages such as the significant cost of investment and the absence of a premium price for GAP-certified products. These acted as a barrier to the adoption of the certification programme for the majority of growers (Banzon et al. 2013a). Reimer, Weinkauf, and Prokopy (2012, p. 120) said that "individuals are likely to vary in their perception of a given practice's relative advantage. This is because an individual's characteristics, or that of their farm business, or their context may influence how they perceived the technology. Banzon et al. (2013a) must have had growers who perceived a relative advantage or others who perceived a relative disadvantage. These latter people would be those who in the knowledge stage saw a need, but in the persuasion stage decided it was not worth adopting.

Banzon et al. (2013a) reported that one of the Cavendish banana plantations participated in the *GlobalGAP* certification scheme. Characteristics of the farm business would include the nature of their existing QMS and also their motivation, e.g. they want to be *GlobalGAP*-certified. If they had something in place that was as good as, or better than the *PhilGAP* certification programme, they were unlikely to adopt it or continue on with the process. The Cavendish banana plantation that has adopted *GlobalGAP* certification has increased its productivity following the *GlobalGAP* guidelines, and is perceived to have increased confidence to maintain their export markets or penetrate new ones (Banzon et al., 2013a). In contrast, Lockie et al. (2014) revealed that some buyers do not explicitly

require certification to any standard aside from the compliance with the *ISO 9000*. This standard is consistent with the government's policy on chemical residue limits, accreditation of exporters and employment of quality assurance officers (Lockie et al., 2014). Nonetheless, the relative advantage of the *PhilGAP* certification programme over *GlobalGAP* or *ISO 9000* has not been examined because there was no *PhilGAP*-certified Cavendish banana plantations in 2011 (Banzon et al., 2013a).

On the other hand, the Cardava banana farmer cooperative perceived the relative advantage from adopting PhilGAP certification was access to NGO manuals and training that would improve farm practices, provison for subsidied infrastructure, and local government unit's (LGUs) subsidisation of medical expenses for the growers (Banzon et al., 2013a). The training, manuals and infrastructure were also perceived to result in an increase in crop yield and on-farm productivity.

Pannell et al. (2006) argued that the relative advantage of an innovation plays a crucial role that drives the adoption of practices. For example, *MyGAP*-certified vegetable farmers in Malaysia adopted the programme with the perception of having a better life with a healthy lifestyle because of the negligible chemical residues in food, and living up to their religious responsibilities in terms of being caring towards others and the environment (Tey et al., 2016). Participating in the *MyGAP* certification programme also created a social status and one was viewed as being a responsible farmer because the compliance criteria were perceived to improve the quality of agricultural products. The minimum requirements set by the programme were also perceived to provide other relative advantages to farmers such as improved food safety, increased product prices, improved access to export markets, and improved confidence in the products by consumers among others (Tey et al., 2016).

Complexity

Complexity is the second perceived characteristic of a technology identified by Rogers (2003) and it is defined as the degree of perceived difficulty in understanding and implementing an innovation (Rogers, 2003). It increases the level of effort needed to implement an innovation and consequently reduces the relative advantage of an innovation (Pannell et al., 2006). As such, complicated innovations are more often adopted at a slower rate compared to simple innovations that are easy to understand (Rogers, 2003). The *PhilGAP* certification programme is a labour and capital-intensive technology and, as such, growers perceived it as a complicated programme (Banzon et al., 2013a). Banzon et al. (2013a) reported that growers needed to learn new skills in planning and managing their operations, such as record-keeping for pesticide use, and install new facilities required to meet the programme standards. Similarly, Wongprawmas et al. (2015) found that producers who did not adopt *QGAP* in Thailand perceived it as a complicated and time-consuming endeavour as it entailed tedious record-keeping.

Compatibility

Compatibility is the third perceived characteristic of a technology identified by Rogers (2003) and it is defined as the extent to which an innovation is perceived to be consistent with the current needs, existing socio-cultural values and beliefs, and past experiences of possible adopters (Rogers, 2003, p. 15). As a QMS, the *PhilGAP* certification programme sets a minimum standard for quality. Interestingly, Banzon et al. (2013a) reported that none of the 33-member Cavendish banana companies in their study in 2011 had adopted the *PhilGAP* certification programme, despite the data suggesting the technology was relatively compatible with their current practices and socio-cultural values and beliefs. The corporate visions and guiding principles of these companies reflected quality and safety as paramount concerns, such as "Total quality is our way of life" and "Quality from seed to shelf" (Banzon et al., 2013a, p. 19). However, one of these plantations became *PhilGAP*-certified only at the completion of the Banzon et al. (2013b) report. Thus, the comparison between the *PhilGAP*-certification programme and their existing QMS was not presented in the previous study.

Trialability

Trialability is the fourth perceived characteristic of a technology identified by Rogers (2003) and it is defined as the extent to which an innovation can be tested on a small scale or for limited conditions (Rogers, 2003, p. 16). Innovations that can be used partially or tried using a small amount of the existing resources will generally be adopted more quickly than innovations that come as a whole new package (Rogers, 2003). For example, the Cardava banana farmer cooperative initiated an incremental adoption of *PhilGAP* for their production practices with "one step at a time" starting in 2008, until the cooperative decided to apply for *PhilGAP* certification, and it obtained its *PhilGAP* certificate in 2011 (Banzon et al., 2013a, p. 32). Members of the cooperative were practising the traditional way of banana production such as cleaning, debelling and desuckering, which are included as one of the components of *PhilGAP*. With the goal of participating in the *PhilGAP* certification programme, farmers in a few areas started to add practices that were stipulated in the programme such as tagging the bunches for traceability purposes and periodic soil and water sampling to monitor water quality (Banzon et al., 2013a). For Cavendish banana plantations, Banzon et al. (2013a) reported that corporate growers who are not certified with *GlobalGAP* believed that they had observed practices equivalent to the *PhilGAP* practices by implementing a generic GAP programme. On the other hand, Banzon et al. (2013a) also reported that the *GlobalGAP*-certified corporate banana grower trialled small areas for the *GlobalGAP* certification programme before expanding this to other areas.

Observability

Observability is the fifth perceived characteristic of a technology identified by Rogers (2003) and it is defined as the visible manifestation of the perceived benefits as a result of the innovation by the potential adopter (Rogers, 2003, p. 16). A prior observation of the potential results of the adoption of an innovation by a peer creates a perception of the innovation that can lead to the adoption or

rejection by the potential user (Rogers, 2003). Banzon et al. (2013a) reported that Cardava banana growers who practised *PhilGAP* had produced larger and heavier bunches of bananas than those bananas produced on non-GAP plantations. As such, the local traders buy the banana at the farm instead of farmers going to the public market to sell the *PhilGAP*-certified bananas (Banzon et al., 2013a).

Risk

Risk is the sixth perceived characteristic of a technology. Reimer et al. (2012, p. 120) defined risk as "variation in likely benefits or costs associated with a sustainable practice, variation in the effectiveness of the practice, and variation as to when the benefits might be realized". Banzon et al. (2013a) identified the risk associated with *PhilGAP* certification as being found to be non-compliant with the standards during an audit and inspection after all the preparation has been undertaken. Although training and seminars have been provided to the growers, there is no guarantee that implementation will be effective. For example, banana growers are expected to observe the MRL for every pesticide applied on the banana plantation by following pesticide label recommendations. However, compliance with MRL can only be validated through chemical laboratory testing and it takes time to obtain the result. If the result shows that GAP standards are not met, the applicants are at risk of failing to obtain the certificate (Banzon et al., 2013a). The long time lags between harvesting and obtaining the result of the analysis contribute to the risk because it provides scope for unanticipated changes in market demand, competing products or damage to the harvested product (Pannell et al., 2006). For example, some fruit and vegetable farmers in Thailand perceived that samples taken during the audit have very little risk of chemical residue detection, as compared to the high risk of losing a part of the harvest because of pest damage (Schreinemachers et al., 2012).

Other risks identified by Banzon et al. (2013a) are the potential increased competition and saturation in the international market. However, some banana growers are not troubled because of the quasi-market segmentation of other banana-growing and exporting countries. Producers from Latin America and South African countries cater to the demands of North America and European markets, respectively, while the Philippines dominates the Asian markets (Banzon et al., 2013a). However, the market also triggers the situation of the "unethical practice" of "pole-vaulting" where the producer ignores contractual obligations with their exporters because of variation in spot prices in the market (Banzon et al., 2013a, p. 38). The perceived risks associated with the technology could act as a barrier to the adoption. The next section presents the decision stage of the adoption process.

3.3.3 Decision Stage

The decision stage is where farmers take part in activities that can lead to the adoption or rejection of the innovation (Rogers, 2003, p. 177). However, by taking part in different activities, each stage of the adoption process becomes a potential decision point (Rogers, 2003). Farmers perform small-scale

trials or observe demonstration trials by other farmers or farmer groups, to determine the degree of relative advantage provided by the innovation prior to adoption or rejection of the technology (Rogers, 2003). He then defined adoption as the decision to fully utilise the innovation while rejection means otherwise. Active rejection means not adopting the innovation after doing some trials, while passive rejection is an outright decision not to adopt without doing trials (Rogers, 2003). For technologies that come in packages, an aggregate adoption can be observed as measured by the extent of adopting the selective components of the technology in a certain region or locality (Feder et al., 1985). The *PhilGAP* certification programme involves changes in a number of practices to meet the standards and the application for the certification process (Banzon et al., 2013a). As such, farmers who adopted *PhilGAP* practices cannot be *PhilGAP*-certified unless they apply for certification.

3.3.4 Implementation Stage

The implementation stage is where the innovation is applied and put into use (Rogers, 2003, p. 179). However, operational problems may arise during the implementation of the innovation due to the reinvention or modification of the technology by the adopter. Modifications usually occur when: (1) the innovation is complex; (2) the adopter lacks full knowledge about the innovation; (3) the innovation has broad possible applications; or (4) the innovation is customised to individual needs for pride of ownership (Rogers, 2003). More often, the implementation of an innovation is more complicated when an organisation or group is involved as compared to an individual adopter due to varying needs and expectations (Rogers, 2003). The implementation of the *PhilGAP* certification programme occurs when the farmer applies for certification and this is reviewed and audited by the *PhilGAP* certification committee (Banzon et al., 2013a). The farmers are then expected to maintain the improved practices to consistently meet the agreed standards.

3.3.5 Confirmation Stage

Finally, the confirmation stage is when the farmer seeks reinforcement of the decisions and actions made (Rogers, 2003, p. 189). The adopter seeks supportive messages and actions that will prevent the discontinued adoption of the innovation. A confirmation in the adoption of the *PhilGAP* certification programme is the issuance of the certificate from the government and the producer's continued participation in the programme through the annual renewal of the certificate (Banzon et al., 2013a). Nonetheless, discontinuance may occur as a result of the replacement by another innovation or disenchantment with the newly-adopted innovation (Rogers, 2003). Rogers (2003) pointed out that each stage of the adoption process can be a rejection point when the expectations of perceived benefits are not attained. Indeed, Srisopaporn et al. (2015) found participation in the public GAP certification programme in Thailand was discontinued when rice farmers encountered an increase in labour costs and more tedious record-keeping as required by the programme.

The stages in Rogers' (2003) adoption process provided a lens to view the barriers to, and drivers of, adoption. The following section reviews the barriers to the adoption of public GAP certification programmes, such as *PhilGAP*.

3.4 Barriers to the Adoption of Public GAP Certification Programmes

The literature has highlighted that governments face a number of barriers in relation to the implementation of public GAP programmes. Banzon et al. (2013a) identified the barriers that affect the adoption of a generic GAP programme for the Cavendish banana plantations. It also follows that these barriers hindered the adoption of the *PhilGAP* certification programme. These barriers were classified as: (1) knowledge, (2) costs, (3) processes, (4) rewards or incentives, (5) scale of farm operations, and (6) trade issues in the banana industry. Thus, this section provides a review of barriers to the adoption of public GAP programmes in the literature.

3.4.1 Knowledge Barriers

Banzon et al. (2013a) identified the lack of awareness as a major barrier to the adoption of *PhilGAP* certification programme (see Section 3.3.1).

3.4.2 Cost Barriers

The second type of barrier to adoption identified by Banzon et al. (2013a) was the compliance costs associated with the participation in the programme. There were two kinds of costs, namely: (1) compliance costs, and (2) certification costs. The former includes installation of new facilities, additional training of farm workers on safety and record-keeping, acquisition of more appropriate personal protective equipment, and safety instructions among other things. The latter includes the administrative cost of certification such as travel expenses incurred during inspection and the cost of microbial and chemical residue analysis. The Philippine government waived the latter cost similar to Thailand's *QGAP and*, as such, certification cost is not a barrier to the adoption of the programme (Banzon et al., 2013a; Nabeshima et al., 2015; Sarsud, 2007). However, Banzon et al. (2013a) reported that the Cardava banana farmers did not immediately participate in the certification programme as they needed financial resources to comply with the requirements. This compliance cost barrier was overcome through the provision of subsidies for infrastructure such as toilets and netting of packing facilities that were provided by an NGO, and the subsidisation of medical expenses for the growers by the LGUs.

3.4.3 Process Barriers

The third type of barrier to adoption identified by Banzon et al. (2013a) was the certification process associated with participation in the programme. In this process, banana farmers needed to acquire new skills in managing and planning their operational activities, such as record-keeping of pesticide use and the incidence of pests. This was also reported by Banzon et al. (2013a) among mango growers.

However, there are other audit process problems identified in the literature (Sarsud, 2007; Schreinemachers et al., 2012; Wongprawmas et al., 2015). Thus, the process barriers include: (1) a lack of coordination among government agencies, (2) a perceived lack of credibility in the audit process, and (3) a perceived lack of enforcement. These are discussed in the following sections.

Lack of coordination among government regulators

Banzon et al. (2013a) reported that the mango growers complained about the lack of coordination among government agencies pushing for *PhilGAP* adoption leading to bureaucratic delays. This lack of coordination has also been reported in Vietnam's *VietGAP* and Thailand's *QGAP* public GAP programmes (Nicetic, Fliert, Chien, Mai, & Cuong, 2010; Sarsud, 2007). The different government agencies that manage the *VietGAP* certification programme failed to coordinate and harmonise policies at the national level and this discredits the independent roles of each agency (Tam, Loan, Hien, & Thuy, 2007). In addition, the Thailand government set an over-ambitious objective of certifying a large number of producers, yet there was a lack of coordination between government institutions and knowledge institutions such as universities and research agencies (Sarsud, 2007; Wongprawmas et al., 2015).

Perceived lack of credibility

Another important process barrier for the adoption of public GAP programmes is the perceived lack of credibility in the certification process by growers and traders (Sarsud, 2007). For example, the Ministry of Agriculture and Cooperatives (MOAC) and its underlying departments in Thailand carried out the overall operations of *QGAP* including the setting of standards, training, auditing, inspection and certification (Sarsud, 2007). A study was conducted to explore the perceived barriers that hindered the adoption of *QGAP* in Thailand's fresh fruit and vegetable industry (Wongprawmas et al., 2015). The results showed that the audit system was poorly adopted because of the growers' distrust of government agencies based on their experience working with them within the food safety area over the years (Wongprawmas et al., 2015). This was supported by the growers' doubt over political manipulations (Sarsud, 2007).

Perceived lack of enforcement

Another process barrier is the retailers' perceived lack of enforcement by government agencies, thus a public GAP certificate is not required by the retailers from the producers (Schreinemachers et al., 2012). A study was conducted with fruit and vegetable growers in Thailand in 2011 to test whether fruit and vegetable farmers who were compliant with *QGAP* used less toxic pesticides and had a lower frequency of application than non-compliant farmers, and to understand whether public GAPs can or cannot reduce agricultural pesticide use (Schreinemachers et al., 2012). The study found that spray diaries and residue test results were not properly inspected and audited. Although the programme required three inspection visits per year without prior notification to farmers, in reality farmers were notified prior to the inspection and audit. This gave them time to prepare for the

compliance assessment. Only one audit was undertaken per year, and young and inexperienced auditors spent as little as five minutes at each farm during the inspection process. Additionally, the age gap between the auditors and farmers, and cultural aspects, prevented the auditor from criticising the farmers about their pesticide practices. As a result of these contextual factors, farmers were unlikely to fail to gain *QGAP* certification irrespective of their farm practices. The high number of participating farmers in the *QGAP* certification programme in Thailand had compromised the quality of the programme and, in particular, the auditing process. There were only 120 government auditors who were required to audit 140,000 registered farmers. Technical assistance from the Department of Agricultural Extension (DoAE) was insufficient to cover the number of participating farmers. As such, the farmers did not understand the rationale behind the control points specified in the standards, which led to poor motivation in keeping to them. Thus, Schreinemachers et al. (2012) argued that *QGAP* was not a viable alternative to the more stringent private standards used in Thailand to guarantee food safety.

A study of the *VietGAP* citrus programme in Vietnam by Nicetic et al. (2010) found that the training of extension personnel was also a barrier to the enforcement of the public GAP programme. Under GAP principles, registered pesticides are specific to crop and pest combinations and this was understood by some farmers. However, a few extension agents thought that pesticides could be applied to any crop as long as its use was not banned. This then created confusion in the implementation of the *VietGAP* certification programme because there can be no established withholding period if it is not specifically registered for citrus. Thus, the public GAP programme was criticised for the lack of enforcement because of insufficient trained personnel to effectively implement the programme (Nicetic et al., 2010; Schreinemachers et al., 2012).

In banana plantations that were not following private standards in the Philippines, Lockie et al. (2014) found that the public regulations were not fully enforced despite the presence of codified laws. For instance, the buffer zones were not properly observed, and minimum wages were audited through document inspection only rather than interviewing workers or undertaking investigative activities. Thus, Lockie et al. (2014) argued that encouraging plantations to comply with national standards is effectively pointless when the government monitoring and enforcement processes are inadequate, inefficient and weak.

3.4.4 Reward or Incentive Barriers

The fourth barrier to the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) is the lack of demand and a premium price for *PhilGAP*-certified products. They argued that the government's efforts are focused on the adoption of the certification programme and, to a lesser extent, on market promotion of *PhilGAP*-certified crops. Amekawa (2013) found that the government

in Thailand put much more resources into promoting organic and fair trade production of agricultural produce than they did for *QGAP*. As such, there was no economic incentive for *QGAP*-certified growers such as price premiums or floor prices as compared to fair trade or organic producers. In addition, Srisopaporn et al. (2015) found that the lack of incentives hindered the adoption of the *QGAP* programme among farmers renting land for agricultural production because they might not recover the cost of investments in the land that they did not own.

3.4.5 Scale of Farm Operations

The fifth barrier to the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) was the scale of the operation for small banana growers. One of the certification criteria requires a 50-metre buffer zone around a water source. Banzon et al. (2013a) reported that this could be a problem for small farmers where the average farm size was 1.73 hectares because of the reduction in the production area. Such farmers also lacked of economies of scale for investment in the facilities required by the certification programme. The *PhilGAP* programme comprises a cluster of technologies that require investment in infrastructure and facilities to meet the demands of export markets. Large-scale technologies are often supported by a large, prosperous and rapidly-growing population with "striking homogeneity of tastes" (Abramovitz, 1986, p. 397). However, Marine et al. (2016) argued that practices that are related to food safety and environmental protection do not depend on the size of the operation.

3.4.6 Trade Issues in the Industry

The sixth barrier to the adoption of the public GAP programmes are the trade issues in the industry such as the pole-vaulting operations identified by Banzon et al. (2013a). In this process, a contract growing arrangement occurs when a grower enters into a supply agreement with the institutional buyers at a predetermined price for the production and supply of agricultural products for a certain period of years (Digal, 2007). Growers are expected to have the facilities needed to produce the bananas, but the institutional buyers are expected to provide technical assistance to the growers to meet certain quality requirements. Because of price competition in the international markets, some banana growers do not honour their contractual obligation to their exporters or institutional buyers, an unethical practice in the industry (Banzon et al., 2013a). Such a practice affects the traceability of bananas, which is a key component of public GAP programmes (Amekawa, 2009; Nicetic et al., 2010; Robert & Menon, 2007). The following section reviews the literature on the drivers of adoption of public GAP programmes.

3.5 Drivers of Adoption of the Public GAP Certification Programmes

There were no *PhilGAP*-certified Cavendish banana plantations in 2011. However, the study conducted by Banzon et al. (2013a) reported that the drivers of the adoption of a generic GAP programme for the Cavendish banana plantations in the Philippines were: 1) the requirements of the

international market, and 2) the presence of a quality-focused corporate culture. In Cardava bananas, grower adoption of the *PhilGAP* certification programme was driven by the support from the NGOs and the LGUs. A number of drivers of the adoption of public GAP certification programmes by growers has been reported in the literature (Robert & Menon, 2007; Nicetic et al., 2010; Ha, 2014; Srisopaporn et al., 2015; Nabeshima et al., 2015; Tey et al., 2015), particularly when compared to private GAP schemes. These include: (1) provision for a minimum standard of production, (2) less stringent inspection, audit and monitoring systems than *GlobalGAP*, and (3) the provision of subsidies by the government. These drivers are discussed in the following sections.

3.5.1 Minimum Standard of Production

A public GAP certification programme provides a minimum standard of production to meet the agreed quality standards (Ha, 2014; Nicetic et al., 2010; Srisopaporn et al., 2015). Ha (2014) found that farmers following a *VietGAP* management regime for the vegetable choy sum (*Brassica rapa* var. *parachinensis*) achieved higher production levels with lower inputs than farmers using conventional management who used higher levels of inputs such as fertilisers and pesticides. Srisopaporn et al. (2015) found that *QGAP* adopters demonstrated better pest and nutrient management operations compared to non-*QGAP* adopters and, as such, their rice produce was perceived as a safer product by the buyers.

Nabeshima et al. (2015) found that if a company aims to obtain *GlobalGAP* certification, participation in a local version of *GlobalGAP* or a public GAP would be better than starting from nothing. For example, *VietGAP* standards on food safety were equivalent to that of *GlobalGAP*, especially in relation to fertiliser and pesticide usage and managing microbial contamination. However, the *VietGAP* standards for environmental sustainability and workers' protection were inadequate to comply with *GlobalGAP* (Nicetic et al., 2010). Similarly, Thailand's *QGAP* and Malaysia's *MyGAP* were harmonised from the *GlobalGAP* standards (Robert & Menon, 2007; Sarsud, 2007; Tey et al., 2015). Farms were assessed by the level of compliance so that level 1 entails compliance with the production processes for safe products, level 2 requires additional compliance for pest-free products, and level 3 demands full compliance on all elements including harvesting and post-harvest handling of products (Robert & Menon, 2007; Sarsud, 2007). Srisopaporn et al. (2015) argued that the *QGAP* programme had been successful in introducing positive technological changes to upgrade the production practices in rice farming and could set the minimum standards for agricultural production. However, Tey et al. (2015) argued that the minimum requirements set by the public GAP programme needed to be clearly positioned as a system that yields better food quality which could then lead to gains in relative economic advantage.

3.5.2 Less Stringent Inspection, Audit and Monitoring Systems

It has been found that farmers participate in the public GAP programme because it has less stringent inspection, audit and monitoring systems than *GlobalGAP* (Nabeshima et al., 2015; Schreinemachers et al., 2012). The Ministry of Agriculture, Fishery and Forestry (MAFF) of Japan attempted to duplicate *GlobalGAP* in 2007 and introduced '*Basic GAP*' as the 'best practice' instead of using the *Basic GAP* as a way to standardise procedures and ensure consistent management practices among producers (Nabeshima et al., 2015, p. 5). MAFF viewed *Basic GAP* as a new 'technology' subject to diffusion and voluntary adoption (Nabeshima et al., 2015, p. 8). Despite the absence of fiscal incentives, the adoption rate was higher than expected because the 'best practice' concept was open to interpretation, and verification was made through self-assessment only. Thus, there was no documention provided to producers to certify the adoption of *Basic GAP*. This failure to provide documentary proof of compliance has led to the formation of *JapanGAP (JGAP),* a private-led firm that follows a *GlobalGAP* scheme. Nonetheless, Nabeshima et al. (2015) argued that *Basic GAP* provided production guidelines to farmers so that their practices could be improved.

3.5.3 Provision of Government Subsidies

Research has shown that local versions of public GAP programmes harmonised from *GlobalGAP* have much lower certification costs for producers than *GlobalGAP* because of government subsidies (Banzon et al., 2013a; Nabeshima et al., 2015; Nicetic et al., 2010; Sarsud, 2007). In Vietnam, *GlobalGAP* certification for a citrus farm costs VND 30,000,000 (EU€ 1,365) a year, while *VietGAP* certification costs VND 10,000,000 (EU€ 455) a year (Nicetic et al., 2010). In Thailand, farmers are encouraged to participate in the *QGAP* certification programme through its free certification services (Sarsud, 2007). Similarly, the BAFS of the Philippines has waived the PHP 50,000 (US$ 1,640.41) certification fee to encourage farmers to participate in the *PhilGAP* certification programme (Banzon et al., 2013a). However, the private sector perceives subsidised government QMS as being of dubious quality (Wongprawnas, 2015). As a consequence, growers tend to participate in private QMS such *GlobalGAP* and this is explained in the next section.

3.6 Farmers' Motivations for Adopting Private QMS Certification Programmes

This section reviews the literature about growers' motivations for adopting private QMS certification programmes. This is because growers' adoption of a public GAP programme could be affected negatively by their view of the existing private QMS programme as a competing technology. A private system of governance or private QMS was developed by private coalitions to engage in policy-making, enforcement, monitoring and compliance of agreed codes and practices (Henson & Humphrey, 2010). Participation in a private QMS such as *GlobalGAP* is voluntary and often costly because of the significant amount of investment required by producers to meet the standards (Amekawa, 2009). However, there is an increasing number of companies participating in private GAP

schemes (Amekawa, 2009; Bain et al., 2013; Burrell, 2011; Henson & Humphrey, 2010; Vandemoortele & Deconinck, 2014; Von Schlippenbach & Teichmann, 2012). The adoption of private GAP schemes has occurred for several reasons. These include: (1) alternative QMS to ineffective government policies, (2) ideal for a business-to-business model, (3) adds bargaining power to retailers, (4) product differentiation, and (5) anticipation of changes in the future government regulations.

3.6.1 Alternative QMS to Ineffective Government Policies

First, food retailers promote private standards because the traditional command-and-control policies imposed by government generally to protect consumers were criticised for being "ineffective, inflexible and neglecting the responsibilities of citizens and organizations" (Havinga, 2008, p. 3). The use of private standards lessens the consumer's uncertainty and inhibition about the characteristics or attributes of the product (Fulponi, 2006; Vandemoortele & Deconinck, 2014). The product attributes are inspected and audited by a third party certifying body, which is highly beneficial for imported products because it reduces the transaction costs where retailers have to inspect the growers' production areas (Hatanaka, Bain, & Busch, 2005). Thus, compliance with *GlobalGAP* standards provides an alternative QMS to ineffective government policies to ensure export market requirements (Vandemoortele & Deconinck, 2014).

3.6.2 Ideal for Business-to-business Models

Second, most private standards such as *GlobalGAP* operate in a business-to-business model (Kalfagianni & Fuchs, 2012; Tey et al., 2016). In this model, a business transaction is made between the producer and retailer, and customers do not often know the product attributes (Burrell, 2011). In this context, the product attributes such as quality, safety, environmental and social compliance are communicated to the consumers through the product labels of the private standards (Vandemoortele & Deconinck, 2014). In the *GlobalGAP* certification process, a unique 13-digit *GlobalGAP* code is given to the producer and may be printed on the product label or packaging, which can be verified by consumers (Tey et al., 2016).

3.6.3 Adds Bargaining Power to Retailers

Third, retailers promote private standards such as *GlobalGAP* to increase their "bargaining power" over producers (Vandemoortele & Deconinck, 2014, p. 155; Von Schlippenbach & Teichmann, 2012). If producers cannot adjust the products or practices to meet the criteria of the private standards, retailers consider the products to have a lower quality which should be bought at a lower price (Von Schlippenbach & Teichmann, 2012). It also follows that producers who do not adhere to the private standards are excluded from the market because it creates a barrier to market access (Amekawa, 2009; Burrell, 2011; Hatanaka et al., 2005). In contrast, producers who participate in private schemes gain market access and advantage due to the reduced market competition (Jaffee & Masakure, 2005; Von

Schlippenbach & Teichmann, 2012). Thus, Tallontire, Opondo, Nelson, and Martin (2011) argued that the lead buyers or retailers play a dominant role in the food supply chain and compel producers to adopt the standards through the process of certification. The requirements set by the retailer can be a driver for some producers, but a barrier to those who cannot afford the compliance cost of certification (Amekawa, 2009).

3.6.4 Product Differentiation

Fourth, firms employ private standards as a market strategy to differentiate their products and the firm itself in the competitive markets (Bain et al., 2013; Vandemoortele & Deconinck, 2014). If the minimum quality standard often set by the government is relatively low, participating firms operate at higher quality levels thereby differentiating their products in the market (Vandemoortele & Deconinck, 2014). Implementing a more stringent private standard such as *GlobalGAP* is also used to protect the firm's business reputation, and shows to consumers how more socially and environmentally responsible they are compared to other competitors (Bain et al., 2013).

3.6.5 Anticipation for Changes in the Future Government Regulations

Lastly, firms participate in private standards to anticipate changes in future government regulations (Vandemoortele & Deconinck, 2014). As an ultimate repository of heterogeneous types of prescriptions ranging from pre- to post-production practices covered by a wide array of laws for food safety, environmental quality and labour regulations, *GlobalGAP* standards serve as a reference which national public GAP standards are harmonised with (Raymond & Bonnaud, 2014; Valk & Roest, 2009). In such a context, the firms participating in *GlobalGAP* certification have more flexibility to operate at different quality levels when the minimum public standard is introduced (Vandemoortele & Deconinck, 2014).

3.7 Summary

Good Agricultural Practices (GAP) is generally defined as "the application of available knowledge to addressing environmental, economic and social sustainability for on-farm production and post-production processes resulting in safe and healthy food and non-food agricultural products". The concept of GAP is used in regulating production practices to achieve certain quality requirements. However, quality is a contested term in which the meaning varies according to the different groups of people in the agri-food chain such as producers, retailers, customers and government regulators at the local, national and global levels. To provide a better understanding about quality, quality management systems (QMS) are introduced, which contain various attributes relating to product quality. The attributes are then presented as standards that are set by either public or private entities and implemented to the private sector through a voluntary certification programme.

GAP programmes can be either public or private. The formers have standards developed by government institutions while the latter are developed by private institutions or NGOs. The public GAP programmes are often harmonised with *GlobalGAP* in order to facilitate market access or maintain existing markets in the international trade, especially in Europe. On the other hand, the private GAP programmes are *GlobalGAP* itself or the private sector-led GAPs programmes in different countries that are benchmarked from *GlobalGAP*. Some authors argue that public and private GAP programmes as antagonistic to one another, while others argue that there is no dichotomy between private and public standards as a matter of regulation, but it is rather a continuum of regulations in which public and private regulations are at the opposite ends of the continuum. Thus, both public and private GAP programmes can co-exist and be practised by a single entity at the same time. These GAP programmes can be viewed as a new technology intended for adoption.

The process of adoption was reviewed following Rogers' (2003) innovation-decision process model that includes different stages such as knowledge, persuasion, decision, implementation and confirmation. Each of these stages can be a rejection point for the potential adopter in relation to the perceived characteristics of the technology such as relative advantage, complexity, compatibility, trialability, observability and risks associated with the adoption of the innovation. The adoption process proposed by Rogers (2003) provides a valuable tool for structural analysis to identify the barriers to, and drivers of, growers' adoption of the *PhilGAP* certification programme and other public GAP programmes despite its criticism for being linear and lacking feedback mechanism.

The barriers to the adoption of public GAP programmes can be classified under six types: (1) knowledge, (2) cost, (3) processes, (4) rewards or incentives, (5) scale of farm operations, and (6) trade issues in the industry. On the other hand, the drivers of adoption of public GAP certification programmes include: (1) provision for minimum standard of production, (2) less stringent inspection, audit and monitoring systems than *GlobalGAP*, and (3) the provision of government subsidies. However, some of the actors from the private sector perceives subsidised government QMS as being of dubious quality. Thus, growers resort to the participation in the private QMS such as *GlobalGAP*. The motivations for participation in a private QMS certification programme, particularly *GlobalGAP*, include: (1) serves as an alternative QMS to ineffective government policies, (2) ideal for business-to-business models, (3) adds bargaining power to retailers, (4) provides product differentiation, and (5) anticipation of changes in the future government regulations.

This chapter provided the review of literature relevant to the barriers to, and drivers of, adoption of the *PhilGAP* certification programme. The next chapter provides the methodology used to carry out this research.

Chapter 4: METHODOLOGY

4.1 Introduction

This study was initiated to revisit and investigate the drivers of, and barriers to, the adoption of the *PhilGAP* certification programme five years after the initial study in 2011. The study seeks to address the following research questions: (1) Do the same barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations identified by Banzon et al. (2013a) still exist or have new drivers and barriers emerged since the initial study in 2011?; (2) How have these barriers continued to limit the adoption of, or how have these drivers led to the adoption of, the *PhilGAP* certification programme by Cavendish banana plantations in the Philippines?; and (3) Why do some Cavendish banana plantations adopt and continue to participate in the *PhilGAP* certification programme despite these barriers?

This chapter describes the method used in this study. A change in the writing style is used in this chapter in that it is written from the first person point of view. This is in recognition of the role played by the researcher in qualitative research (Poggenpoel & Myburgh, 2003). It is a writing style that acknowledges the significance of my obligation as '*a research instrument*' in constructing and interpreting knowledge about the case in the process of writing this thesis (Poggenpoel & Myburgh, 2003, p. 418). This chapter is made up of six sections. Section 4.2 describes the research paradigm that was adopted for this study. Section 4.3 explains the choice of research strategy that is deemed appropriate for the research questions in this study. Section 4.4 describes the process of developing the research design including case selection, a sampling strategy, the data collection and data analysis procedures. Section 4.5 describes the ethical considerations associated with this study. Finally, Section 4.6 provides a summary for the chapter.

4.2 The Research Paradigm

A research paradigm is "a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research" (Bogdan, 2007, p. 24). It is a theoretical framework that contains the researcher's view of reality, nature and the acquisition of knowledge, and the set of beliefs that precedes their actions (Denzin & Lincoln, 2008). It therefore influences the way reality is viewed, studied and interpreted. In the absence of recognising the research paradigm, there is no rational basis for subsequent choices in undertaking research activities (Mackenzie & Knipe, 2006).

Research undertaken in agricultural science is predominantly structured in a positivistic paradigm, which views reality as governed by immutable laws that can be defined in absolute terms through scientific methods (Pretty, 1994). Consequently, a positivistic paradigm is acceptable in terms of scientific principles that are independent of human context. Although the *PhilGAP* certification

programme follows scientific principles, it cannot be separated from the people who continuously develop and adopt the programme, and those who learn from the dynamic interactions within that system. Thus, an alternative view that guides this research is a constructivist-interpretive paradigm, which accepts that "no scientific method will ever be able to ask all the right questions" about the problems in agricultural systems (Pretty, 1994, p. 38). The problems surrounding the adoption of the *PhilGAP* certification programme are open to interpretation because different stakeholders, especially those with socio-economic interests and involvement, have varied perspectives on what constitutes a problem and how to improve it. The adoption of the programme is a social process, even more than a technical issue (Rogers, 2003). Hence, reality is socially constructed. It follows that the *PhilGAP* and its certification programme exist, but it is the meaning and the interpretation of these practices and the programme that define how it is understood and adopted.

The agricultural practices operating in banana plantations are context-dependent (Lockie et al., 2014), while the regulations governing the implementation of the *PhilGAP* certification programme are subject to the perceptions of the growers (Banzon et al., 2013a). Since the context and perceptions are products of human construction, the investigation is bounded by a large number of theories and choosing a single theory cannot be undervalued (Pretty, 1994). My knowledge of the existing context, and the growers' perceptions about the certification programme, play a vital role in forming the findings of the research. Thus, a case study research strategy aligned with the constructivist-interpretative theoretical paradigm was used in this study as explained in the succeeding section.

4.3 Choice of Research Strategy

A research strategy is a systematic plan of action that puts "the paradigm into motion" (Denzin & Lincoln, 2008, p. 34). A rational extension of the research paradigm is a qualitative case study strategy. A case is "a bounded system, or a particular instance or entities that can be defined by identifiable boundaries" (O'Leary, 2005, p. 79) and a case study approach provides opportunities to investigate "real-world problems" (O'Leary, 2005, p. 80). The poor adoption rate of the *PhilGAP* certification programme in the Cavendish banana plantations is a real-world problem and this study aims to investigate what constitutes the barriers to and drivers of adoption.

In agricultural systems research, a case study strategy is generally accepted since agricultural issues are temporal, spatial, complex and intricately linked to various actors with different views (Lockie et al., 2013). The background conditions are subjected to "context-dependent interpretations" by different actors (Flyvbjerg, 2001, p. 45). The case study research strategy is suitable for capturing in-depth insights, behaviour and interactions with intrinsic values that cannot be captured by large-scale surveys (O'Leary, 2005). It is also suitable for exploring emerging issues which can be detailed, rich and convoluted (Ormston, Spencer, Barnard, & Snape, 2014; Ritchie & Ormston, 2014). The case

study approach is a reflexive approach that recognises my role and perspective in shaping the research on what may work and what may not depending on the available resources (Ormston et al., 2014). In investigating real-world problems, the design for a case study is focused on one site at a particular case (O'Leary, 2005). A description of the research design used in this study is presented in the next section.

4.4 Research Design

The research design is a logical progression that: (1) initially links the theoretical paradigm to the research strategy; then (2) subsequently connects to methods of collection and analysis of empirical data; and (3) finally arrives at a conclusion (Denzin & Lincoln, 2008). Practical aspects to consider in a qualitative case study design are the development of research questions, the role of extant theory, the unit of analysis, the method of data collection, and the data analysis procedures, timeframe and resources involved (Lewis & Nicholls, 2014). For this research, a single-case study design was undertaken as a result of an iterative process of reflection on the literature, peer review, experience, initial key informant interviews, and the feasibility of the research at a limited timeframe. The intent of this research is to investigate the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme in Cavendish banana plantations in the Philippines. Thus, a single-case study was adopted because it provides the opportunity to explore the intrinsic and instrumental attributes of the adopters and non-adopters of the certification programme given the limited timeframe, sensitivity of the issue and availability of the participants (O'Leary, 2005).

Aligned with the constructivist paradigm, a theory building process was developed along with the design of a protocol guided by the literature, data collection and data analysis (Denzin & Lincoln, 2008). The process involves an inductive reasoning in which a singular observation of an instance can lead to a general theoretical statement of an instance (Bendassolli, 2013). Consequently, the primary focus in this situation is to gain an understanding of a phenomenon rather than explaining the phenomenon using predictive indicators (Bendassolli, 2013). In this research, the adoption (or non-adoption) of the *PhilGAP* certification programme by Cavendish banana plantations is the phenomenon of interest. The value of this study lies on the validation of existing knowledge or the emergence of new knowledge central to the research questions based on the experiences and perceptions of the participating plantations and insights from the relevant government regulatory agencies. From there, recommended policies can be developed, which can help improve the implementation of the programme. The succeeding sections will describe each of the steps in the research design.

4.4.1 Case Selection

The process of case selection involves a definition of the case by setting the boundaries and then the selection of respondents, using specific criteria, from within the case boundaries (O'Leary, 2005). The case definition provides the characterisation and meaning central to the research questions. O'Leary (2005) identified four possible case definitions such as individuals, institutions, cultural groups and events. Individuals and cultural groups are characterised by gender, race, class, experiences, employment, geography and social networks among others. Institutions are characterised by functions, public or private operations, size and location, while events are characterised by nature, size, timeline/timeframe and location. There can be other possibilities in defining the case as long as the boundaries are clear, and the reasons for choosing those boundaries are well argued (O'Leary, 2005).

In this research, the boundaries are restricted to the *PhilGAP* certification programme in the case of Cavendish banana plantations in the Philippines. The case was chosen because it can provide valuable insights into understanding the programme in the context of plantation agriculture. The findings in this research can also be used in other plantation crops with export operations such as pineapples, coconuts and mangoes. Consequently, the chosen case has an intrinsic value that can help improve the implementation of the *PhilGAP* certification programme across a range of crops within the Philippines.

Pragmatic considerations can also be used in selecting cases of interest (Berg, 2012; O'Leary, 2005). As a result of the frequent rejection of the Philippine Cavendish bananas in the export market since 2012, the issue of revisiting the agricultural practices at the production level was a timely opportunity for investigation. Plantation practices can be examined by referring to the code developed for the adoption of *PhilGAP* in fruit and vegetables, including bananas. Another pragmatic consideration is the fact that I used to live in the Davao region, where the majority of the Cavendish bananas are grown, and used to work with the banana plantation managers and workers. This meant that I was acquainted with the farming practices in the plantation agriculture, and I had professional and personal networks both in the banana industry and government agencies regulating the industry operations. My work history and field experiences likewise meant that I was able to speak and understand the local language, and had contacts to targeted individuals in the national and regional government agencies. For these reasons, I was likely to gain access to information from the people relevant to the research. The contacted individuals served as initial key informants. They provided a point of reference in forming the boundaries of the case, as well as endorsements to the participants who were unknown to me prior to the research.

The criteria used to select the respondents within the case definition were as follows. First, the respondents had to be commercial banana plantations who grow Cavendish bananas for export. These

plantations are private entities and characterised by having agricultural practices that are different from other types bananas sold in the local market. The plantations are located in Mindanao Island and the size of operation varies from as small as 0.2 hectares to as large as 13,000 hectares.

To identify the respondents who could meet the first criterion, I presented the research proposal on 14 April 2016 in a monthly technical committee meeting of the Pilipino Banana Growers and Exporters Association (PBGEA), a group of export-oriented Cavendish banana companies. This group served as the initial key informants for the research. Prior to the meeting, the executive director of the association informed the member companies about the presentation of the research proposal. The presentation highlighted the significance of the study. Attendees at the meeting ranged from technical research managers to a vice-president of nine banana plantation companies and the executive director of the 33-member company association, who were either directly or indirectly involved in maintaining the company's QMS. This was done to ensure that they met the first criterion of the research, to obtain a broad overview of the problem situation, and find updated information about the status of the *PhilGAP* certification programme in the banana plantations. During the technical committee meeting, I was also referred to another group of banana growers who, it was thought, may have a different adoption status. A list of banana growers from another group and their contact information were also provided at the end of the meeting. In addition, a list of *PhilGAP*-certified farms was obtained by email from the BAFS that serves as a secretariat for the *PhilGAP* certification programme.

The second criterion for the selection of respondents was that they had to fit one of the several types in terms of the adoption (or non-adoption) of the *PhilGAP* certification programme. Interviews with the initial key informants identified that Cavendish banana plantations could be classified into three types on the basis of their adoption (or non-adoption) of the *PhilGAP* certification programme. These were: (1) banana plantations that have adopted the *PhilGAP* certification programme and are therefore *PhilGAP*-certified or (Adopter) Type 1; (2) banana plantations that have not adopted the *PhilGAP* certification programme, but have implemented other forms of QMS certification, normally *GlobalGAP* or (Non-Adopter) Type 2; and (3) banana plantations that have not adopted the *PhilGAP* certification programme and have not implemented other forms of QMS certification or (non-adopter) Type 3. There were no Cavendish banana plantations that have adopted, and then disadopted the certification programme. The *PhilGAP*-certified banana plantations or Type 1 respondents provide an in-depth insight about the drivers of participation in the *PhilGAP* certification programme and how the barriers to adoption were overcome. The non-adopters of the *PhilGAP* certification programme who have implemented other forms of QMS certification or Type 2 respondents provide an in-depth understanding of how the barriers continued to limit their adoption of the *PhilGAP* certification programme despite their having implemented practices that are aligned with *PhilGAP*. Lastly, the non-adopters of the *PhilGAP* certification programme who have not implemented other forms of

QMS certification or Type 3 respondents provide an insight about the barriers to the adoption of the *PhilGAP* certification programme.

To meet the second criterion, banana plantations were identified from the list of *PhilGAP*-certified farms. Only two banana plantations were found on the list and classified as Type 1. Further research identified that both plantations belonged to a large corporation and used the same management practices. For the banana plantations that had not adopted the *PhilGAP* certification programme, but were implementing other forms GAP, Banzon et al. (2013a) reported that PBGEA-member companies were observing GAP and were assumed to fall under Types 1 or 2. Lastly, the Cavendish banana plantations who are neither listed as *PhilGAP*-certified farms, nor are members of the PBGEA, were assumed to fall under Type 3 or banana plantations that have not adopted the *PhilGAP* certification programme and have not implemented other forms of GAP.

The final criterion that influenced the choice of the case studies was access. The pragmatic considerations are of particular use in this situation because the case study research requires "prolonged engagement and development of rapport and trust within a clearly defined and highly relevant context" (O'Leary, 2005, p. 80). It meant that the participation of the banana plantations in the research depends on the participant's trust and confidence in the researcher and the institution he represents.

Upon identification of the types of adopters or non-adopters of the *PhilGAP* certification programme, a purposive sampling strategy was used to select the respondents for each type (Rubin & Babbie, 2010). The staff directly involved in the QMS of the companies were targeted as interview respondents because they have the knowledge of the company's QMS to which *PhilGAP* certification programme could be compared. The main goal was to select information-rich adopters or non-adopters that could be used to answer the research questions. For this reason, two kinds of purposive sampling were employed. Initially, a deviant sampling strategy was used to select suitable types showing unusual attributes or patterns of behaviour or attitude (Rubin & Babbie, 2010). However, a snowball-referral sampling procedure was performed when the initially identified respondents failed to meet the criteria during the data collection process (Berg, 2012; O'Leary, 2005). A deviant sampling procedure was completed for Types 1 and 2 respondents, while the snowball-referral sampling procedure was used for Type 3 respondents as explained in the succeeding paragraphs.

Table 2 shows a list of different types of adopter and non-adopters in this research. For the *PhilGAP*-certified banana plantations or Type 1 respondents, there was no other choice because there were only two plantations belonging to a large corporation that has adopted the certification programme. Thus, the contact person from the company was contacted by email and invited to participate in the study. For the non-adopters that implement other forms of QMS certification or Type 2 respondents, the PBGEA member companies who attended the research proposal presentation were invited to

participate in the research. Because it was difficult to convince these companies to engage in the research, their size of operation, location and management structure were not used as criteria under this type. The invitation came with an assurance that the name of the company and participants will be made confidential and coded in the case report. Due to the possible divulgence of sensitive information, three attendees of the meeting expressed their regret in not participating in the research, while six others sought further approval from their respective company management. Among them, only two companies agreed to participate in the research. For Type 3 respondents, the contact persons from the other group of banana growers were invited to participate in the research by email. However, only one company responded positively to the invitation. Thus, contacts from my personal and professional networks endorsed me to a few responsive banana growers who were willing to be involved in the research. Four new plantation companies were identified and participated under this type. Since *PhilGAP* certification is a QMS, the management structure was used a criterion in choosing respondents under this type.

Table 2. Different types of adopters and non-adopters of *PhilGAP*-certification programme.

Plantation Type	Plantations
Type 1: Adopter of *PhilGAP*-certfication programme	A, B
Type 2: Non-adopter of *PhilGAP*-certfication programme but have implemented other forms of QMS certification	C, D
Type 3: Non-adopter of *PhilGAP*-certfication programme but have not implemented other forms of QMS certification	
Run by a corporation	F, H
Run by a family	E, G, I

One of the companies under Type 3 was identified by a banana exporter and by a government inspector from the BPI-PQS, who then served as one of the key informants for this research. The key infomants could provide a broader background and in-depth insights into the problem situation (O'Leary, 2005). Input providers such as chemical companies were not included in the research because of resource limitations, and their involvements in the plantation practices are at the discretion of the banana plantations.

Apart from the banana plantations, government regulators involved in the *PhilGAP* certification scheme were also interviewed as key informants (Table 3). Initial research revealed that the current implementation of the *PhilGAP* certification programme was in a transition from BAFS to BPI. Thus, the heads of the two agencies were also invited to participate in the research as key informants. The purpose was to gain insights from the experience of the former agency and clarify policy changes from the next agency. The data obtained from these agencies was used for data triangulation, for seeking further understanding about the context of the case and for crafting policy recommendations.

The data collection protocol used for the key informants and banana growers in each type is described in the following sections.

Table 3. Government agencies and head of agencies involved in the implementation of PhilGAP certification programme.

Government Agency	Position
Bureau of Agriculture and Fisheries Standards (BAFS)	Director
Bureau of Plant Industry (BPI)	Director

4.4.2 Design of the Data Collection Protocol

A distinctive feature of case study research is the application of different data collection methods such as field observations, interviews and the sourcing of relevant documents (O'Leary, 2005; Stake, 2008). O'Leary (2005) proposed six steps to guide a qualitative data collection protocol which includes: (1) planning or considering the questions of people, place, time, things and the manner of how the data will be collected; (2) developing the tools for data collection; (3) piloting or conducting a trial; (4) modifying or refining the approach; (5) implementing the actual process of data collection; and (6) managing and analysing or making sense of the data.

The first step of data collection is the planning stage which involves the forethought of the people and access to the information needed in the research (O'Leary, 2005). A large portion of the planning stage was undertaken in the process of case selection. However, O'Leary (2005) recommended additional considerations in the research planning phase such as the role and biases of the researcher, and the ethical review and approval prior to data collection. She suggested to consider the position of the researcher as either an objective scientist, a change agent or a confidante during the process of data collection (Chapter 1, Section 5). In this research, my biases were also recognised so that the subjectivities could be minimised to ensure the credibility of the research. In addition, ethical considerations in dealing with human participants were also reviewed and I sought approval prior to the actual data collection (see Section 5).

The second step was the preparation of the tools for data collection (O'Leary, 2005). A data collection protocol was developed from a constant process of discernment about what data to collect and how to collect it. The tools may include a list of relevant documents, an interview schedule, an observation checklist and other data recording instruments (O'Leary, 2005). The most common primary data collection technique is the semi-structured interview (O'Leary, 2005), which was also determined as the most suitable method to address the research questions for logistical and accessibility reasons. The goal of the research is to investigate the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme. To achieve this goal, an interview guide that contains the list of questions, topics or issues was developed drawn from the background information and literature review (Chapter 3). An interview topic guide used for this research contains a list of information and a set of questions

intended to be answered and explored in a way that is suitable for each type of respondent (Taylor, 2016). Separate interview guides were developed for each type of adopter to find out why they adopted or did not adopt the *PhilGAP* certification programme, and to determine the barriers to, and drivers of, the adoption of the programme. In addition, separate interview guides were developed for the previous and new government agencies involved in the implementation of the *PhilGAP* certification programme. These interviews were used to gain an understanding about how they have promoted the adoption of the *PhilGAP* certification programme, the processes they have in place to assist plantations to adopt the programme, and how they monitor *PhilGAP*-certified entities. The in-depth interview allows the establishment of a good rapport with the participants and the creation of a favourable environment where they can respond freely (Yeo et al., 2014). In addition, it also captures non-verbal communication related to the participants' perceptions, attitudes and meanings in relation to a set of topic or questions. The interview followed a semi-structured approach that integrates a framework of the topic with the flexibility to probe issues that emerged from the predetermined topic (Yeo et al., 2014).

The secondary data used for this research included documents and field observations. The initial data collection plan was to undertake field observations of the banana growers' quality management practices and also collect documents that are relevant to their agricultural practices. These documents include the standard operating procedures, spray diaries, production performance, and customer requirements. However, the plantation owners considered both of these sources of data commercially sensitive, and as such these data collection techniques were not used with banana growers. On the other hand, the secondary data from the government in the form of documents were requested by email. The documents include the list of *PhilGAP*-certified farms and the implemention rules and regulations of the *PhilGAP* certification programme. These documents provide background information about the problem situation.

The third step was to test the interview topic guide through pilot interviews (O'Leary, 2005). The mixed responses during the presentation at a technical committee meeting meant that a pilot interview could not be conducted. However, the topic guide was pre-tested and reviewed by someone whose background was similar to the respondents (Berg, 2012). Hence, the interview topic guides for both banana plantations and the government were pre-tested and reviewed by a peer who worked previously in a government regulatory agency and now worked with the banana plantation industry.

The fourth step was to modify or refine the approach (O'Leary, 2005). Based on the feedback from the peer review of the interview guide, improvements were made to suit the topic for each group of respondents. In addition, the research design was constantly reviewed to reflect the different types of adopters central to the research questions. The fifth step was the actual process of data collection (O'Leary, 2005). The data collection procedure is described in the next section.

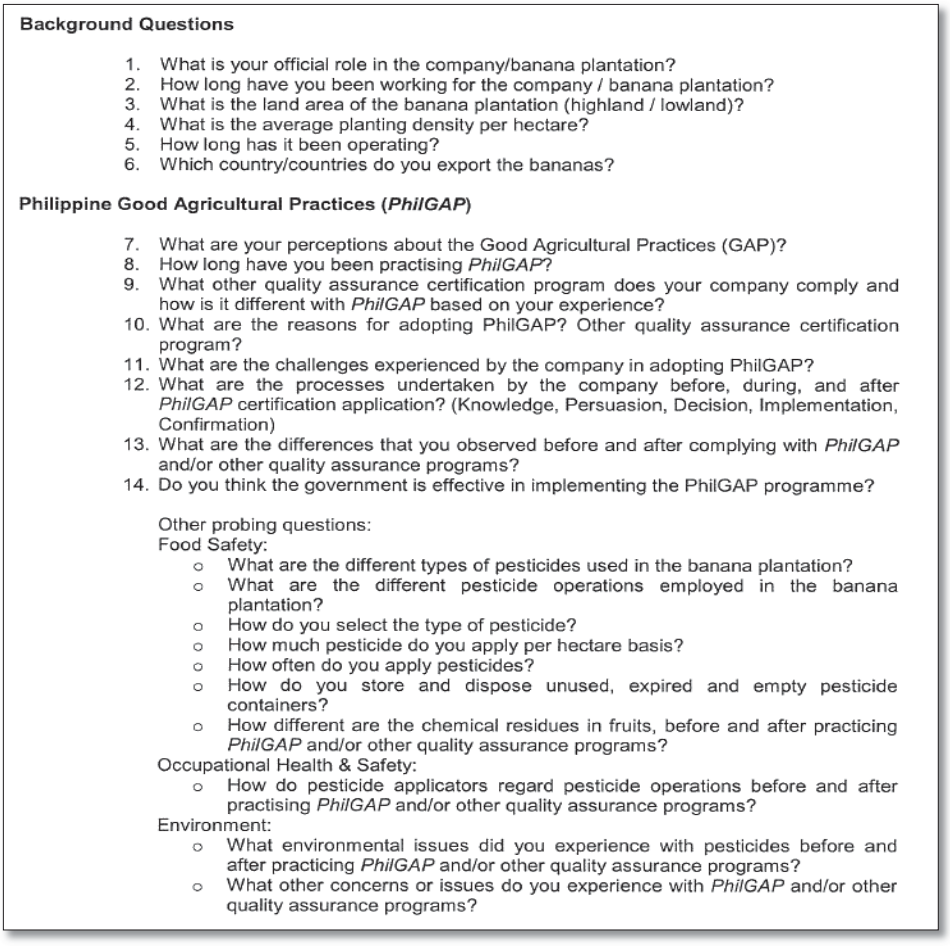
4.4.3 Data Collection Procedure

The first phase of data collection procedure was to collect data about the problem situation. This was achieved through the initial key informants and sourcing relevant documents. Once a potential participant agreed to be involved in the study, each individual was sent an email in July 2016 that contained documents setting out the information relevant to the research and an invitation to participate in the research. The purpose of the study and the approach were outlined to the individual and any questions they had were answered.

The participants were met at the agreed time and place. The information sheets and consent forms were reviewed to allow the participants to clarify issues regarding their participation in the research. At the start of the meeting, the interviewer made an effort to establish rapport using ice-breaking conversation in their preferred language as much as possible. The aim of this phase of the process was to develop trust and respect between the interviewer and the participants (DiCicco-Bloom & Crabtree, 2006). It also helped create a comfortable and safe environment where the participants were more likely to divulge sensitive information and personal views central to the research questions (DiCicco-Bloom & Crabtree, 2006). To further reduce the apprehension of the participants, they were reassured of about the ethical conduct of the research as stipulated in the information sheet provided to them prior to the interview. This included an explanation of participants' rights as a result of their decision to engage in the research, and the participants' freedom to choose their local, national or English language or a mix of languages during the interview.

Once rapport was established, permission was sought to digitally record the interview so that disruptions from note-taking could be avoided and an accurate rendition of data could be obtained (DiCicco-Bloom & Crabtree, 2006). Participants were also requested to sign the consent form. Once this was completed, the interview was then conducted. Non-threatening factual questions about the role of the participants and the size and functions of the organisations they represented were asked at the start of the interview and then followed by open-ended questions about the research topic (Figure 13). The first set of questions was designed to obtain contextual information, from which further questions emerged during the course of the interview (Yeo et al., 2014). These sets of questions were followed by more detailed open inquiries and probing questions relevant to various topics of interest. The nature of these questions depended upon who the participant was, i.e. a key informant or a grower, the type of key informant (government staff member, exporter) and the type of grower (adopter or non-adopter). The topic guide for each type of participant is provided in Appendix 3. This style of interview allowed the participants to relax and it initiated a smooth flow of discussion. The main objective was to increase participant engagement by asking open-ended question and then using prompting and probing questions to gain further insights into the phenomenon. Follow-up questions were used to gain more information relevant to the research (Berg, 2012). Clarification or teach-back

questions were used to ensure the researcher understood the participants comment to avoid the misinterpretation of issues (DiCicco-Bloom & Crabtree, 2006). Although I have a reasonable knowledge about the banana plantation industry, this style of interview has also allowed the exploration of emerging issues and did not constrain their responses to my expectation of the data (DiCicco-Bloom & Crabtree, 2006). Active listening skills were required in order to make swift decisions on which issues to pursue further into. Additional techniques involved the mechanical manipulation of the digital voice recorder such that it did not create a distraction for the participant (O'Leary, 2005).



Background Questions

1. What is your official role in the company/banana plantation?
2. How long have you been working for the company / banana plantation?
3. What is the land area of the banana plantation (highland / lowland)?
4. What is the average planting density per hectare?
5. How long has it been operating?
6. Which country/countries do you export the bananas?

Philippine Good Agricultural Practices (*PhilGAP*)

7. What are your perceptions about the Good Agricultural Practices (GAP)?
8. How long have you been practising *PhilGAP*?
9. What other quality assurance certification program does your company comply and how is it different with *PhilGAP* based on your experience?
10. What are the reasons for adopting PhilGAP? Other quality assurance certification program?
11. What are the challenges experienced by the company in adopting PhilGAP?
12. What are the processes undertaken by the company before, during, and after *PhilGAP* certification application? (Knowledge, Persuasion, Decision, Implementation, Confirmation)
13. What are the differences that you observed before and after complying with *PhilGAP* and/or other quality assurance programs?
14. Do you think the government is effective in implementing the PhilGAP programme?

Other probing questions:

Food Safety:

- What are the different types of pesticides used in the banana plantation?
- What are the different pesticide operations employed in the banana plantation?
- How do you select the type of pesticide?
- How much pesticide do you apply per hectare basis?
- How often do you apply pesticides?
- How do you store and dispose unused, expired and empty pesticide containers?
- How different are the chemical residues in fruits, before and after practicing *PhilGAP* and/or other quality assurance programs?

Occupational Health & Safety:

- How do pesticide applicators regard pesticide operations before and after practising *PhilGAP* and/or other quality assurance programs?

Environment:

- What environmental issues did you experience with pesticides before and after practicing *PhilGAP* and/or other quality assurance programs?
- What other concerns or issues do you experience with *PhilGAP* and/or other quality assurance programs?

Figure 13. Interview topic guide with the list of information and questions.

Towards the end of the interview, respondents were asked if there was anything else they would like to contribute or clarify for the study (O'Leary, 2005). The interview was then closed by thanking the participants for their contribution, and by giving them a small token from the university. Participants were also asked about the possibility of contacting them again for further questions or clarification of topics. They were also informed that a copy of the final report would be provided to them (O'Leary, 2005).

Each interview was transcribed verbatim and translated into English. The verbatim transcript and its English translation was sent to the participants for verification and approval. Some portions of the transcripts were clarified by the participants and one participant requested the deletion of what they viewed as senstitive material from the transcript. The participants were asked to correct or clarify any elements of the transcript they did not agree with, and that the researcher would assume the transcript was suitable to be used in his research if he did not hear from them within seven days of receiving the transcript. No participants withdrew their transcript from this study.

A total of 10 interviews were conducted for the study with an average length of one hour and 30 minutes. Most interviewes involved one participant but some involved two to three participants despite the initial request for a one-to-one interview. This tended to occur when a participant requested that a colleague join the interview to enhance the accuracy and richness of data. In total, 10 banana growers and nine key informants were interviewed. The majority of the participants occupy at least managerial positions and some were members of a team. Tables 4 and 5 enumerate the list of participants from the banana growers and key informants, respectively, and the role they play in the organisation they represented at the time of the research.

Table 4. A list of the banana growers who were interviewed.

Plantation Code	Participant Code	Date Interviewed	Official Position When Interviewed	Other Information About the Participant
Type 1: Adopter of the *PhilGAP* certification programme				
Plantations A & B	Participant 1	22-Aug-16	Superintendent of three departments (Agronomy & Soils, Statistics & Information Management, QMS)	Employed in Plantation A for 25 years; Extends supervision of QMS to Plantation B
Type 2: Non-adopter of *PhilGAP* certification programme but have implemented other forms of QMS certification, normally *GlobalGAP*				
Plantation C	Participant 2	16-Aug-16	Food Safety Compliance Officer, Compliance Department	Employed in Plantation C for 5 years
Plantation D	Participant 3*	5-Aug-16	Team Leader of the Internal Inspectors	Employed in Plantation D for 20 years; Handles field research and agricultural engineering section
	Participant 4		Researcher, Crop Protection Section	Handles QMS compliance for crop protection
Type 3: Non-adopter of *PhilGAP* certification programme and have not implemented other forms of QMS certification				
Plantation E	Participant 5	24-Aug-16	Person-in-charge, Packing Plant	Employed for 8 years; Worked in a multinational plantation prior to Plantation E

Plantation F	Participant 6	29-Aug-16	Operations Manager	Employed for 6 years; Head of Export Division
Plantation G	Participant 16	25-Aug-16	Farm Owner/Grower	Worked previously as a Production Supervisor in Plantation D for 15 years prior to running his own plantation since 2012
Plantation H	Participant 17	25-Aug-16	Operations Manager	Worked previously as a Production Supervisor in Plantation D for 30 years and in other plantations for 15 years
Plantation I	Participant 18*	29-Aug-16	Farm Owner/Grower – Husband	Contract Grower of Plantation D; Used to own a bakery prior to venturing in banana plantation business in 2005
	Participant 19		Farm Owner/Grower – Wife	

*Key participant – in situations where the participant requested additional person to join the interview.

Table 5. A list of key informants who were interviewed.

Key Informants	Participant Code	Date Interviewed	Official Position When Interviewed	Other Information About the Participant
Banana Exporter				
Banana Exporter A	Participant 7*	24-Aug-16	Manager	Manages the export operations of Plantation E
	Participant 8		Head of Quality Inspection	Worked previously in banana plantations
Government Agencies				
BPI-Plant Quarantine Services	Participant 9	24-Aug-16	Inspector	Employed for more than 15 years
Bureau of Agriculture and Fisheries Standards	Participant 10*	2-Sep-16	Member of the *PhilGAP* programme secretariat (deals with the certification applications)	Employed for a year
	Participant 11		Member of the *PhilGAP* programme secretariat (deals with the certification applications)	Employed for more than 3 years; Handles *PhilGAP* application, accompanies inspectors, processes endorsements for certification
	Participant 12		Member of the *PhilGAP* programme secretariat (deals with the certification	Present during the latest *PhilGAP* inspection for

			applications)	Plantation A and B
Bureau of Plant Industry	Participant 13*	29-Aug-16	Officer-in-charge of the Crop Research Production Support Division	Employed for more than 20 years; Handles special projects for rice, corn, high value crops and *PhilGAP* programmes
	Participant 14		Agriculturist II	Next in rank to handle special projects
	Participant 15		Agriculturist I	Provides additional support in the special projects

*Key participant – in situations where the participant requested additional person to join the interview.

Aside from the interviews, documents were also provided by the participants from the government. These documents include a list of BPI-PQS accredited banana farms, packing facilities and exporters, and the relevant memorandum or special orders concerning the *PhilGAP* certification programme within the banana industry as listed in Table 6. The documents contained detailed information which was used to substantiate the data obtained from the interviews. The list of banana exporters, farms and packing facilities, and the draft department circular for the transition in the implementation of *PhilGAP* certification programme were received a few weeks before the interview, and the rest of the documents were received by email after the interviews with government officials.

Table 6. A list of government databases, codes, memorandums or regulations in the banana industry.

Government Agencies	**Document Title**
BPI-Plant Quarantine Services (BPI-PQS)	List of banana exporters, farms and packing facilities
	Memorandum Order 40. Guidelines for the accreditation of exporters, traders, growers and packing facilities for export of fruits and vegetables
	Memorandum Order 41. Revised protocol for the export of fresh bananas
Bureau of Agriculture and Fisheries Standards (BAFS)	Administrative Circular Order 10. Guidelines on the certification of Good Agricultural Practices (GAP) for crops
	PNS/BAFPS 49:2011. Code for Good Agricultural Practices (GAP) for fruits and vegetable farming
	PNS/BAFPS 129:2013. Code for Good Agricultural Practices (GAP) for banana production
	Special Order 284. Designation of National and Regional Inspectors in support of the Good Agricultural Practices (GAP) Programme
	Checklist Inspection of Farms (GAP-02) – Certification Scheme on GAP for fresh fruits and vegetable farming
Bureau of Plant Industry (BPI)	Department Circular (4th Draft). Guidelines on the certification of Good Agricultural Practices (GAP) from crops, amending for the purpose administrative circular 10 – Series 2013

Field observations were not a planned data collection activity because of the initial sense during the technical committee meeting that banana plantations would not allow this to occur because of commercial sensitivity. However, one plantation (a Type 3 respondent) invited me to observe the plantation and its packing facility and asked me to assess if they could also participate in the *PhilGAP* certification programme. The field observation provided a contextual view from which an understanding of the case could be drawn (Barraza et al., 2011). Observations were captured through a hand-held phone camera and photos were used as evidence for data triangulation and subsequent data analysis. Artefacts such as spray diaries and monitoring sheets were not collected due to commercial sensitivity.

The last step of data collection process according to O'Leary (2005) is to manage the collected data. Thus, all data in electronic and printed forms such as interview recordings, transcripts, consent forms, photos and documents gathered during the data collection period were secured at the postgraduate office of the Institute of Agriculture, Massey University. The data were organised and analysed as described in the next section.

4.4.4 Data Analysis

Data analysis was performed using a spiral qualitative data analysis process advocated by Dey (1993). This uses an iterative process of description, classification and connection where several cycles of this process are completed to bring out the accounts from the raw data (Figure 14) (Dey, 1993).

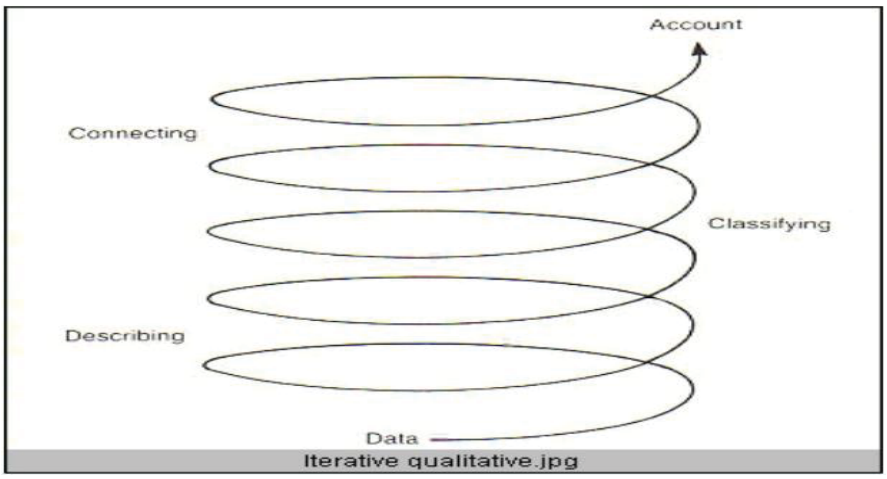


Figure 14. Spiral qualitative analysis (Dey, 1993, p. 53).

The first step in the process was to describe the data to generate knowledge of the situation. This was achieved by typing the digitally recorded interviews verbatim into a word processing document, and then translating the original transcript into English to create a better understanding of the data. Then, notes and diagrams were made based on the transcripts to elaborate key points and processes identified in the data (Dey, 1993). These include management structure, decision criteria, chronological events, and comparison of practices. A general sense of the data was acquired from the repetitive process of listening, writing, formatting, proofreading and describing the interview

transcript. Based on the initial analysis, it was decided to remove three interviews under the Type 3 category because these did not provide further insights into the case study (Ritchie, Lewis, Elam, Tennant, & Rahim, 2014). Issues that emerged from these three interviews were already covered by the two other interviews under this type. For example, 'Plantations E, G, H and I' were not aware of the *PhilGAP* certification programme because they do not belong to an association of banana growers. Thus, only seven approved interview transcripts translated into English were analysed in detail.

The second step was to classify the data into categories and sub-cateories (Dey, 1993). Classification is a key step in developing conceptual framework that guides the action of the research and in reducing the data into a manageable format (Creswell, 2013; Dey, 1993). To achieve this, a computer software programme *NVivo version 11 Pro* was used to classify, sort and arrange unstructured data for qualitative data analysis (QSR International, 2015). It was used to create themes based on the literature review as well as those that emerged from the data. The adoption process proposed by Rogers (2003) was used as a lens to identify the barriers and drivers of the *PhilGAP* certification programme. Figure 15 shows the themes created for this research, i.e. the stages of the adoption process as a 'node'. The interviews, referred to as 'sources', were re-read and coded according to the themes, which were referred to as 'references'. The numbers represent the frequency of the themes in each source or reference. Documents obtained from the government agencies and photos from the field observation were also entered in the software, which were used as a reference for triangulation.

The final step was to identify substantive connections by linking the categories (Dey, 1993). The linkages can be explanatory, causal and chronological relationships that portray a process (Dey, 1993). Although *Nvivo version 11 Pro* software was capable of linking the categories together, it was decided to make the connection process manually because the created categories made it relatively simple to identify their relationships.

'Queries' and 'reports' were generated using the *Nvivo version 11 Pro* software in order to draw insightful information for building the theory for this case. The coding matrix was used as a guide for subsequent analyses across types. The coding summary was used as a reference for outlining the results chapter of the thesis. Writing the results was in itself an analytical process because it involved a continuous re-examination of data (Hunt, 2010; O'Leary, 2005). The results from each respondent type were written as a report and these formed the basis of the results chapter. Since the findings from this research are intended for policy recommendations and public use, ethical issues were properly addressed as explained in the next section.

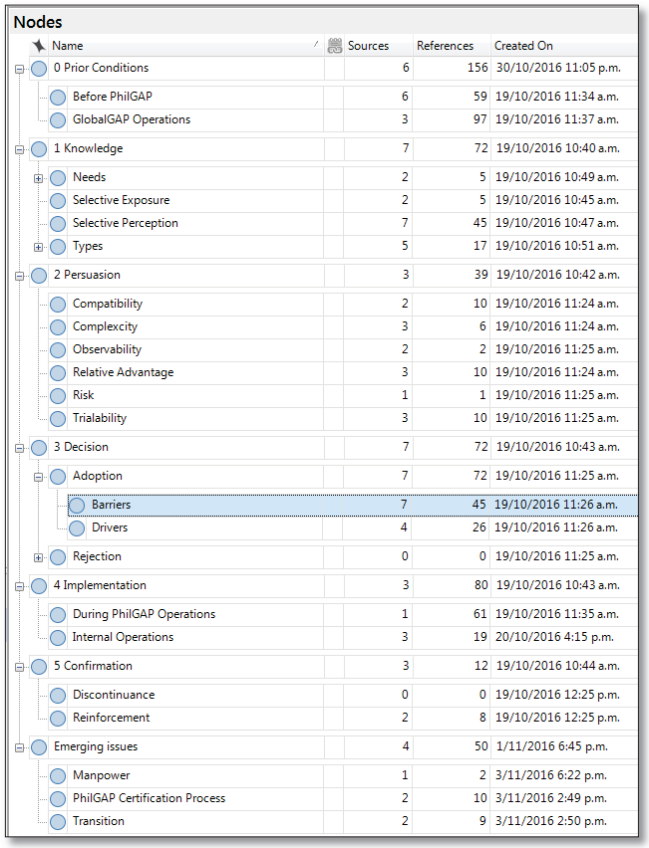


Figure 15. General overview of themes created based on the innovation-decision process.

4.5 Ethical Considerations

The single most important ethical consideration for this research was the confidentiality of information generated from the interviews, documentation and direct observation. This information relates to the business practices of banana plantations which may be proprietary and confidential in nature. For this reason, the participants could withdraw from the research, or remove sensitive transcript data after the data collection. To manage this, participants and the plantation companies were not named and provided with a code. However, the participant under Type 1 was made aware that full confidentiality could not be guaranteed because the plantations he represents are the only *PhilGAP*-certified banana plantations in the country. In addition, the Massey University Human Ethics Committee (MUHEC) application requirements were complied with in March 2016 to ensure that the confidentiality of information and the identity of the participants were carefully managed. The background to the research and details of the data collection, analysis and storage processes were also presented. In addition, risk assessments were also performed with a primary focus on informed and voluntary consent, and the privacy and confidentiality of the participants. A 'low risk notification' category was then obtained from the MUHEC Research Ethics Administrator (Appendix 4).

4.6 Summary

To investigate the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme in the Philippine Cavendish banana plantations, a single case study was completed based on a constructivist-interpretive theoretical paradigm. The case study strategy was found compatible with agricultural systems research due to the nature of agricultural issues as temporal, spatial and complex.

Detailed descriptions of the research design were presented in this chapter. The case was selected to provide valuable insights into improving the implementation of the *PhilGAP* certification programme in the country. Pragmatic considerations in choosing the case were also stated. Based on the varying adoption status of the Cavendish banana plantations three types were identified, namely: (1) banana plantations that have adopted the *PhilGAP* certification programme and are therefore *PhilGAP*-certified or Type 1 respondents; (2) banana plantations that have not adopted the *PhilGAP* certification programme, but have implemented another form of QMS certification, normally *GlobalGAP* or Type 2 respondents; and (3) banana plantations that have not adopted the *PhilGAP* certification programme and have not implemented other forms of QMS certification or Type 3 respondents. A purposive sampling procedure was used to select participants for each type, starting with a deviant sampling for Types 1 and 2, then snowballing sampling for Type 3. The reasons for undertaking the chosen sampling strategy were also explained in detail.

The data were collected in August-September 2016 through face-to-face interviews with key informants, documentation and field observations. The interviews followed a semi-structured approach which enabled the re-examination of the existing barriers and drivers as well as the exploration of emerging ones. It provided in-depth perceptions and context-dependent information that was necessary to build theory or strengthen existing theory relevant to the research. The documents and field observations were used for data triangulation.

Interviews were digitally voice recorded, transcribed verbatim and translated into English. The transcripts were sent back to the participants for verification and approval. For ethical considerations, some transcripts were modified according to the participants' requests, while other transcripts were considered approved when comments were not received from the participants after seven days. Approved transcripts were analysed and coded using *Nvivo version 11 Pro,* a computer-assisted qualitative data analysis software. Themes were created based on the literature review and emerging issues from the transcript. Queries and reports were generated and used for detailed analysis. A description of the case and results of the analysis are presented in the succeeding chapter.

Chapter 5: CASE DESCRIPTION

5.1 Introduction

The aim of this research is to investigate the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations. The study seeks to address the following research questions: (1) Do the same barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations identified by Banzon et al. (2013a) still exist or have new drivers and barriers emerged since the initial study in 2011?; (2) How have these barriers continued to limit the adoption of, or how have these drivers led to the adoption of, the *PhilGAP* certification programme by Cavendish banana plantations in the Philippines?; and (3) Why do some Cavendish banana plantations adopt and continue to participate in the *PhilGAP* certification programme despite these barriers? Prior to answering these questions, this chapter provides a description of the case under investigation to help the reader understand the results presented in the subsequent chapter. The case description chapter is divided in six main sections. Section 5.2 describes the development of the *PhilGAP* certification programme and Section 5.3 describes the certification process. Section 5.4 describes the participating plantations in this research. Section 5.5 provides a comparison of farm characteristics. Finally, Section 5.6 provides a summary of the chapter.

5.2 Development of the *PhilGAP* Certification Programme

The *PhilGAP* certification programme was conceptualised in 2004 as a component project of the quality assurance systems for the ASEAN Fruits project sponsored by the ASEAN-Australia Economic Cooperation (BAFS, 2015). It was formed because of: (1) emerging food safety and quality issues in the agricultural sector; (2) the requirements of some retailers to meet consumers' expectations and their changing preferences for food products; (3) pressure from the World Trade Organization to observe GAP in international trade; and (4) the emergence of GAP programmes in neighbouring countries in Southeast Asia (Cruz, 2015). As a result, the Philippines' standard setting agency, BAFS, was tasked to: (1) align the existing local agricultural practices with the project; (2) incorporate the principles of hazard analysis and critical control points for food safety against any microbial, chemical and physical hazards in local practices; and (3) develop a regulatory framework for the programme based on the existing GAP models such as ASEAN GAP and *GlobalGAP*. As a result of these initiatives, the guidelines on the certification of GAP for fruit and vegetable farming were issued in the Department of Agriculture Administrative Order (DAAO) number 25, series of 2005.

The main objectives of the *PhilGAP* certification programme are: (1) to facilitate the adoption of GAP to ensure food safety and product quality, while also ensuring environmental protection and the health, safety and welfare of workers; (2) to produce safe and high quality agricultural crops for

consumers; and (3) to facilitate access for agricultural crops from the Philippines to neighbouring ASEAN markets and other foreign markets. However, farmers' adoption of the certification programme was very low. In fact, the first *PhilGAP*-certified farm completed the certification process in 2007, two years after the programme was launched. The challenges during the early years of implementation are attributed to farmers' resistance to change, and because the effects of the changes are not immediately seen, so there are misconceptions about the high cost and a lack of benefits from improved market returns (Cruz, 2015). In addition, there was also a lack of coordination among the concerned government parties such as inspectors, extension workers and administrators of the programme and a lack of collaboration with local retailers who could have helped promote the adoption of PhilGAP certification programme (Cruz, 2015).

To enhance the adoption of the programme, the Administrative Order number 25, series of 2005 was amended through the Administrative Order number 30, series of 2008. The amendment includes free certification costs, including the administrative expenses incurred during the inspection and evaluation of the application. In addition, the cost of microbial and chemical analyses of the product samples collected during the inspection will be borne by the government. However, the cost of re-analysis will be borne by the applicant if the first set of samples fails to meet requirements. These changes are applicable to both first-time applicants and those who were seeking an annual renewal of their certificate.

To increase the level of awareness among farmers, the government promoted *PhilGAP* to producers through training and seminars. The training is provided by the Agricultural Training Institute (ATI) in coordination with the regional field offices of the Department of Agriculture and the LGUs. In addition, the government organised market activities for *PhilGAP* products to educate consumers about food safety through the Agribusiness and Marketing Assistance Services (AMAS). Training and marketing information are disseminated through the Agriculture and Fisheries Information Services (AFIS) provided by the Department of Agriculture at their national and regional offices.

In addition, the government continued to improve coordination among the concerned parties involved in the certification system to be more credible, affordable and valuable to the stakeholders. Likewise, the government continued to participate in the ASEAN regional and international economic cooperation by harmonising the standards and building the technical capacity of the implementers (Cruz, 2015). The ASEAN GAP regional standards and their interpretive guidelines were developed based on four modules, namely: (1) Produce Quality; (2) Food Safety; (3) Workers' Health, Safety and Welfare; and (4) Environmental Management. As such, *PhilGAP* certification modules were also aligned with the ASEAN modules to which applicants are expected to comply.

Despite these efforts, there was very little improvement in the adoption rate, with only seven certified farms recorded at the end of 2012 (Banzon et al., 2013b). The low adoption rate was attributed to the

generic standards for fruit and vegetables. Each type of fruit or vegetables has a specific set of agricultural practices and the application of a generic standard could be ambiguous to farmers. Thus, another amendment was released in Administrative Order number 30, series of 2012 to customise the standards to specific fruit and vegetables such as corn and mangoes. Then the latest amendment was made into Administrative Order number 10, series of 2013 to customise agricultural practices in other crops such as rice, sugarcane, coconut, bananas and pineapple. However, the Food Safety Act 2013 was ratified during the same year period. The new law has mandated BPI to regulate the primary production and post-harvest stages of food derived from crops. As such, there is a transition period from July 2015 to December 2016 when BAFS passes over responsibility for the *PhilGAP* certification programme to BPI. During this period, both BAFS and BPI are working together to draft new implementing rules and regulations for the *PhilGAP* certification programme. As of January 2016, there are 74 *PhilGAP*-certified farms from accross a range of crop commodities including two farms of Cavendish bananas (Roscom [Personal Communication], 2016). The standards used for each crop vary, but the certification process is the same, and this is described in the next section.

5.3 The Process of the *PhilGAP* Certification Programme

The *PhilGAP* certification programme is managed through the GAP Certification Committee (GAPCC) (Figure 16). It comprises a chairperson who is the director of BAFS and a vice-chairperson who is the director of BPI. It has four permanent members who are the executive directors of the Fertilizer and Pesticide Authority (FPA), and the Philippine Centre for Postharvest Development and Mechanization (PhilMec), and the directors of the Bureau of Soil and Water Management (BSWM) and the Agricultural Training Institute (ATI). It has seven commodity-based members who are the respective national programme coordinators for high value commercial crops (corn and cassava, and rice grains) and the respective administrators of the National Food Authority (NFA), the Philippine Coconut Authority (PCA), the Sugar Regulatory Authority (SRA) and the executive director of the Philippine Rice Research Institute (PhilRice). There are also these other members who are the respective directors of the Bureau of Animal Industry (BAI), Agribusiness and Marketing Assistance Services (AMAS) and Agriculture and Fisheries Information Services (AFIS). The GAP Certification Committee reports to the secretary of the Department of Agriculture. It provides the recommendations and endorsement of the certificate for the signature and approval of the secretary. It implements *PhilGAP* through three organisations, namely: the secretariat, the technical working group (TWG), and its *PhilGAP* inspectors. The secretariat is composed of technical staff from BAFS and they provide administrative support to the GAPCC and communication of relevant information to applicants of *PhilGAP* certification programme. The TWG provides technical support for the development and implementation of the *PhilGAP* programme by reviewing the standards, evaluating the inspection reports, and validating the interpretation of the results of the microbial and chemical residue analyses. The GAP inspectors include appropriate professionals and qualified technical staff

appointed by the secretary through endorsements from any of the Department of Agriculture regional executive directors (REDs) or directors from BPI, BSWM and FPA. The GAP inspectors perform farm visits and investigate the compliance or non-compliance of the applicants to the set of standards.

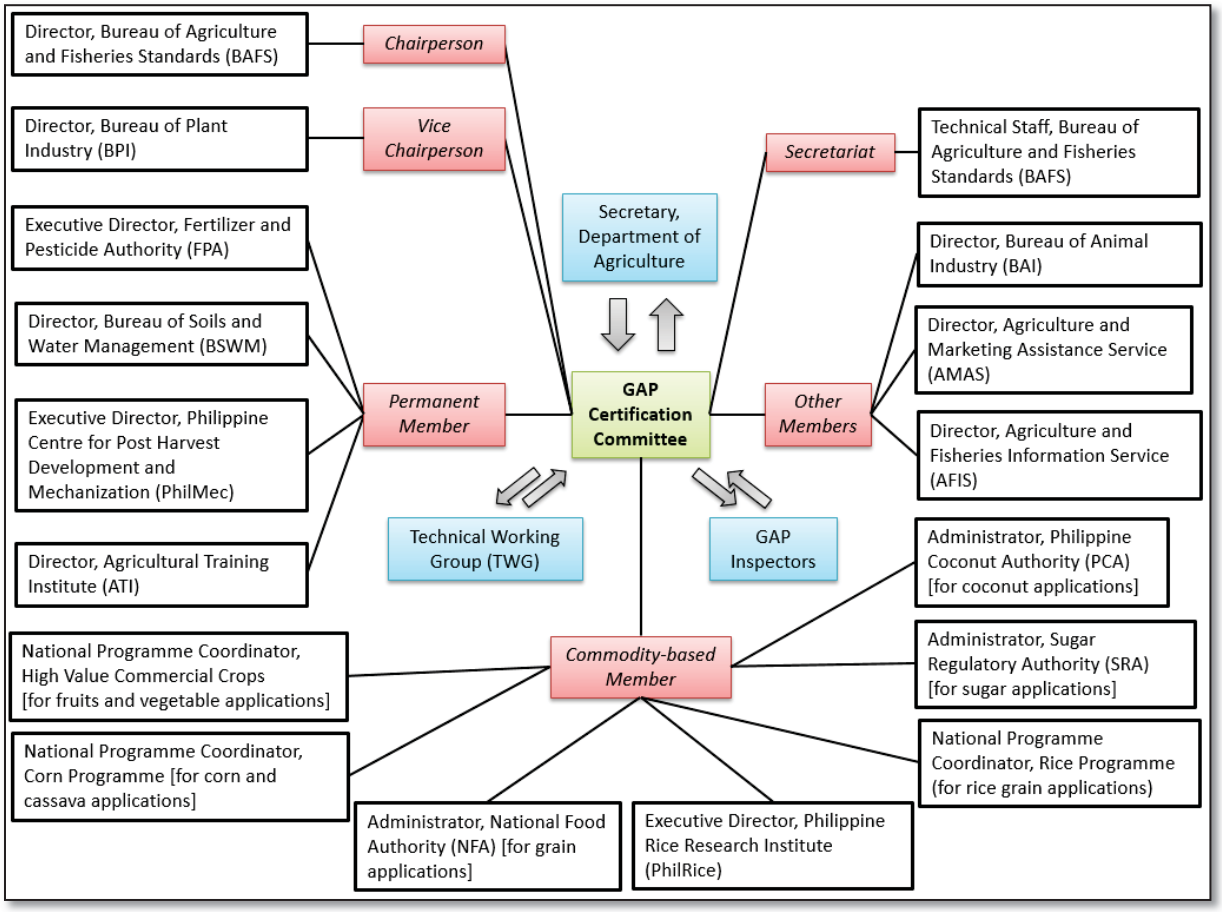


Figure 16. Structure and functions of the GAP Certification Committee based on the Department Administrative Order, number 10, series of 2013.

The applicants in the *PhilGAP* certification programme can be any of the following: individual farmers or growers, partnerships or joint ventures, cooperatives, corporations, associations or organisations and demonstration farms of the government, and research or academic institutions. Prior to an application for *PhilGAP* certification, the applicant has to ensure that the physical conditions of the farm or area to be certified are compliant with the four modules of *PhilGAP*. To do this, the applicant may use the *PhilGAP* certification guidelines specific for their crop commodity to make a self-assessment. In addition, the applicant has to prepare a set of documents such as field operation procedures including the list of agrochemical products, farm or organisation profile, a map of the farm or area to be certified, local government permits if applicable, and a certificate of training on *PhilGAP*. Once all of the documents are ready, the applicant can proceed with filling in an application for *PhilGAP* certification.

The *PhilGAP* certification process has five major steps (Figure 17). First, the applicants submit a set of documents to the of the Department of Agriculture's regional field office. Then, the regional executive director forwards the documents to the GAP secretariat at the BAFS national office. The GAP secretariat evaluates if the documents meet their minimum requirements. If the documents are acceptable, the GAP secretariat sends a notification of inspection to the applicant within 10 days from receipt of the documents. During step two, GAP inspectors conduct an initial site visit. During the site visit, the inspectors will collect harvested product samples for chemical residue and microbial contamination analysis. The inspectors provide an inspection report to the secretariat and the results of the residue and microbial analysis from the department's accredited laboratory within five days from the date of the inspection. The secretariat sends both the report and results of the analysis to the TWG. In the third step, the TWG performs a thorough review of the report and the results of the residue and microbial tests. If the results from the site inspection and laboratory analysis are acceptable, the TWG writes a summary and endorsement to the GAPCC. During the fourth stage, the GAPCC evaluates the endorsement from the TWG. The GAPCC has the power to deny, approve or place the application on a pending status. They notify the applicant of their status within 15 days of the date of evaluation. Lastly, the GAPCC submits an endorsement to the secretary of the DA for final approval through the issuance of the *PhilGAP* certificate within 30 days. The regional GAP inspection team monitors the *PhilGAP*-certified farms annually to ensure that the practices are maintained. The farms can use the *PhilGAP* logo on their product labels as a proof of compliance to the *PhilGAP* certification standards. However, if standards are not maintained, the BAFS secretariat notifies the farm representative about the violation and they are given a warning. Failure to correct the problem will result in the revocation of the certificate.

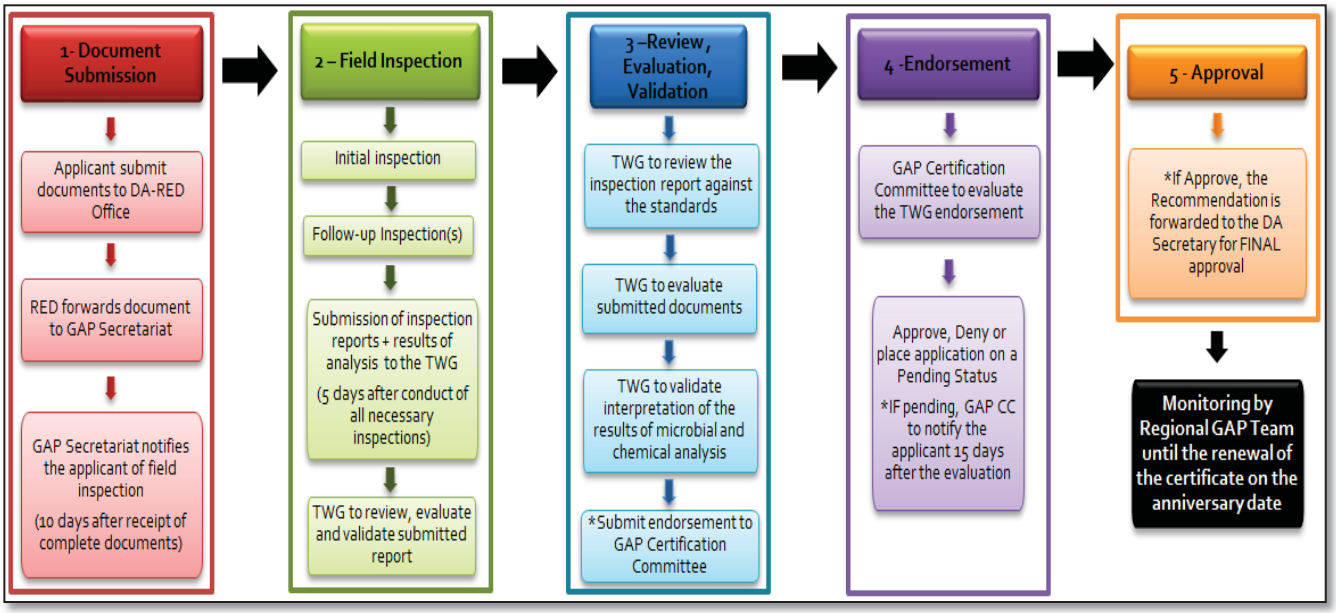


Figure 17. The *PhilGAP* certification process (Mandigma, 2015).

The *PhilGAP* certification process has been undertaken by two Cavendish banana companies since 2011. A description of these companies and other participating plantations in this research is presented in the next section.

5.4 Description of the Case Plantations

The description of the case plantations is an important component of this case study research. This provides the context of the case, especially the participating plantations. This section describes the selected adopters or non-adopters in this study, namely: (1) banana plantations that have adopted the *PhilGAP* certification programme and are therefore *PhilGAP*-certified or 'Type 1' respondents; (2) banana plantations that have not adopted the *PhilGAP* certification programme, but have implemented another form of QMS certification, normally GlobalGAP or 'Type 2' respondents; and (3) banana plantations that have not adopted the *PhilGAP* certification programme and have not implemented other forms of QMS certification or 'Type 3' respondents. In each type, a description of the participating plantations is provided in the succeeding sections.

5.4.1 Type 1: Adopters of the *PhilGAP* Certification Programme

There are two banana plantation companies operating under this adopter type, coded as 'Plantation A' and 'Plantation B'. However, both plantations belong to a large corporation, in which 'Plantation A' is the flagship company while 'Plantation B' is an expansion company. Both plantations are located in the Mindanao Island of the Philippines (Figure 18). Since the QMS used on both plantations is the same, 'Participant 1' was interviewed about both plantations. The following sections describe the farm characteristics of these plantations relevant to the adoption of *PhilGAP* certification programme.

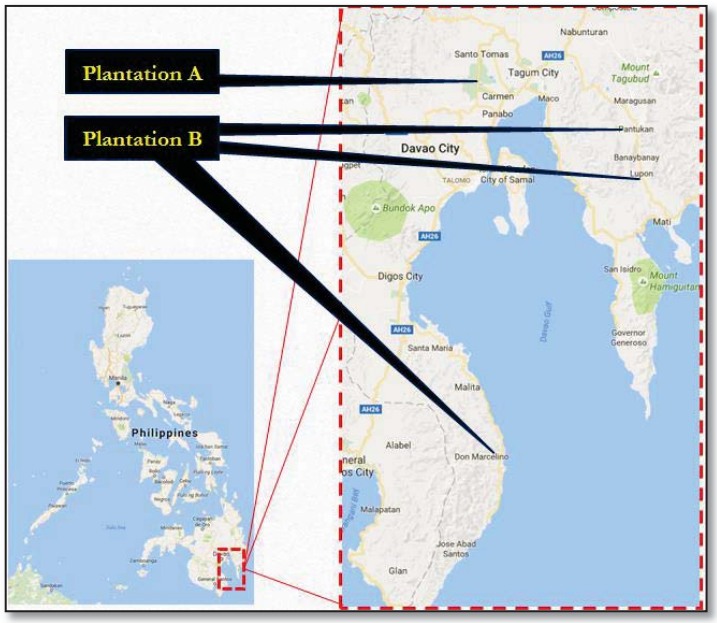


Figure 18. Map of the Philippines (Google Maps, 2016), magnifying the Davao region where 'Plantations A and B' are located.

5.4.1.1 Plantation A

'Plantation A' is owned and managed by a Filipino-owned corporation that owns many other businesses in transport, container port terminals, real estate, and resorts among others. However, 'Plantation A' is the flagship company that started as an abaca (*Musa textilis)* plantation for the fibre industry in the 1950s. Then it shifted to Cavendish bananas (*Musa acuminata)* in the 1970s in a contiguous lowland area located in Davao del Norte. 'Plantation A' has been involved in banana production for 45 years and currently has over 6,640 hectares planted with bananas. They produce an average of 5,000 boxes of bananas per hectare per year or the equivalent of 30 million boxes or 390 million metric tonnes of bananas annually. The growing areas of 'Plantation A' are divided into six districts and each district has two to three zones. Each zone contains different farms operated by a manager. Each farm contains a '*parcela'* of land comprising of 55-65 hectares. The harvested bananas from each zone are brought to a common packing station and each district has two to three pack houses. In total, 'Plantation A' has 16 pack houses.

'Plantation A' employs up to 10,000 direct employees for banana production. Figure 19 shows the management structure of 'Plantation A'. The organisation is headed by the chief operating officer (COO) for the banana operations who reports to a board of directors of a large corporation. Reporting to him are the vice-presidents from different divisions including agriculture production, research, the information and compliance division, and the administration division. Reporting to the vice-president of the agriculture division are the six district superintendents who manage both the plantation zones and packing stations. Each zone contains farm managers who supervise parcela managers and plantation workers. Likewise, each packing zone is led by a manager who oversees the activities of the workers in the packing facilities. The research, information and compliance division is headed by the vice-president and subordinated by a superintendent. Reporting to the superintendents are the managers from the Agronomy and Soils department, Statistics and Information Management department and the QMS department. The Agronomy and Soils manager oversees the operations of the agronomy, soils, tissue culture and chemistry laboratories led by their respective heads. Likewise, the Statistics and Information Management manager supervises the operations of the statistics laboratory and information management units led by their respective heads. In addition, the QMS manager leads a team of internal auditors. Lastly, the vice-president for administration oversees the administrative functions of the company. The Finance department is concerned with the monetary position of the company and its profits and losses. The Human Resources department is responsible for recruitment, training and employee-related concerns. The Engineering department is responsible for infrastructure maintenance and improvement. The Purchasing department is responsible for the acquisition of company assets and supplies. The Logistics department is responsible for the movement of inputs and outputs within the plantation.

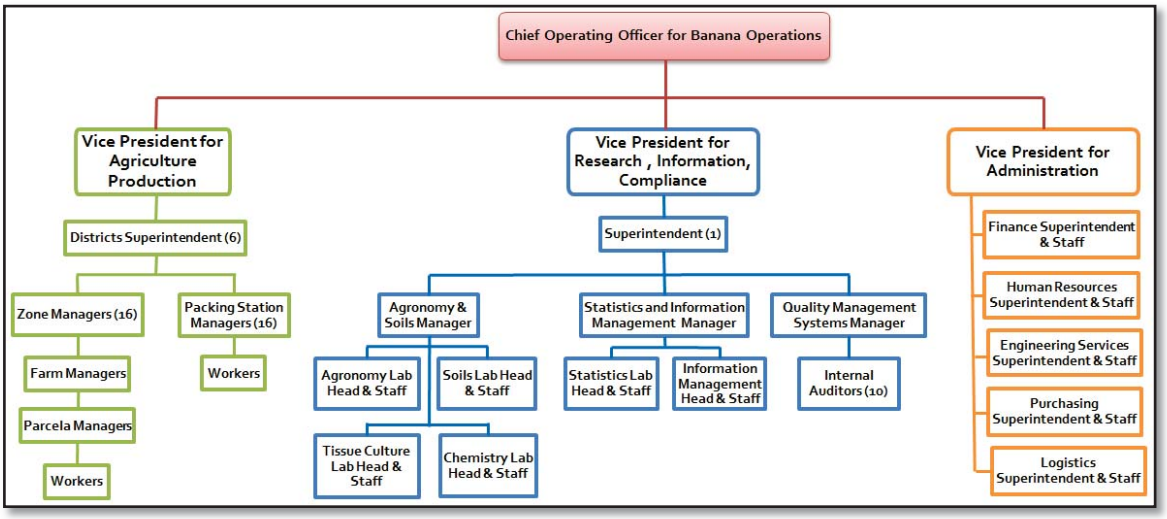


Figure 19. The high-level management structure of 'Plantation A'.

In addition, 'Plantation A' also employs people who manage corporate social responsibility projects. These are projects that aim to help the communities living within the plantation areas. These include medical missions, the donation of classrooms and hospital facilities, the provision of livelihood training for the spouses of the workers, and scholarship programmes for the workers and their dependents. The company also supports a penal farm in partnership with the government, so that inmates receive wages in exchange for farm work on the plantation.

The company's operations have been aligned with *ISO 9001* and *ISO 14000* and certified with *PhilGAP* since 2012, then with *GlobalGAP* a year later. These QMS suit the company's corporate culture of "*Total Quality"* as a way of life. They have competent staff as well as in-house analytical laboratories to ensure that the quality requirements of their customers are met.

As a contracted grower, 'Plantation A' started its operations according to the recommended practices of their first institutional buyer, coded as 'Customer A', which is a multinational agricultural producer and marketer. In 2014, another multinational producer and marketer became their second institutional buyer, coded as 'Customer B'. Thus, they observe the recommended practices from both institutional buyers, especially in terms of pesticide usage. Bananas from 'Plantation A' are exported to the Japanese, Korean, Middle East, Chinese, Singaporean, Hong Kong, New Zealand and Malaysian markets under the brands of their two respective customers. In some cases, 'Customer B' sells a small portion of the produce on the local market.

5.4.1.2 Plantation B

In 2010, the corporation that owns 'Plantation A' purchased a new banana company called 'Plantation B'. Unlike 'Plantation A', the land area in 'Plantation B' is fragmented across three lowland areas. The latter has two sites in Compostela Valley covering more than 320 hectares and another site in Davao Occidental with 165 hectares (Figure 18). As an expansion area of 'Plantation A', the management structure for the agriculture and administrative divisions of 'Plantation B' are similar to

'Plantation A' but on a smaller scale. However, its research, information and compliance operations are reliant on that of 'Plantation A'. Thus, 'Plantation B's' operations are also aligned with *ISO 9001* and *ISO 14000*. Two years after 'Plantation A' obtained *PhilGAP* certification, 'Plantation B' obtained its certification as well. However, it has yet to gain *GlobalGAP* certification. Nonetheless, it has produced 334,000 boxes of Class A bananas since 2010. The bananas are sold to a multinational company coded as 'Customer C' and exported to three main markets – the Middle East, Japan and Korea – using another brand.

5.4.2 Type 2: Non-adopters of the *PhilGAP* Certification Programme Who Have Implemented Another Form of QMS Certification, Normally *GlobalGAP*

Key informants identified that there were a number of banana plantations in the Philippines that had adopted *PhilGAP* practices, but were not certified. Two of these plantations were investigated to gain insights into the reasons they had partially adopted *PhilGAP*. That is, they had implemented *PhilGAP* practices, but they had not obtained *PhilGAP* certification. The two independent banana companies are coded as 'Plantation C' and 'Plantation D'. The central offices of both companies are located in the Davao region but their banana plantations are located on Mindanao Island. Both companies have corporate-managed farms along with contracted grower areas. The following section describes the two plantations in more detail.

5.4.2.1 Plantation C

'Plantation C' is a local subsidiary of a multinational corporation that engages in many other businesses such as agrochemicals, machinery, transportation and communication among others. 'Plantation C' has been an institutional buyer, grower and exporter of Cavendish bananas since the 1970s. It covers a total area of 13,000 hectares of Cavendish bananas and distributes across five provinces in Mindanao Island (Figure 20). The provinces include Bukidnon, Compostela Valley, Davao del Norte, South Cotabato and Surigao del Sur. Of the total plantation area, 50% is leased by the company from different land owners and it manages the operations (Table 7). The corporate-managed farms are subdivided into 10 districts, and each district is composed of different growing areas in which 50% is in the highlands and another 50% in the lowlands. These areas produce bananas – at least 3,500 boxes per hectare annually. These areas have been participating in the *GlobalGAP* certification programme beginning with one district in 2009, and achieving certification for the entire managed farms in 2014. The areas with *GlobalGAP* certification are also following *PhilGAP* practices but did not seek to obtain certification. On the other hand, the farms under contract growership have a total area of 6,500 hectares, of which 1,300 hectares are in the highlands and 5,200 hectares are in the lowlands. In these areas, only 200 hectares are *GlobalGAP* certified, but the company aims to obtain *GlobalGAP* certification for the total area by the end of 2018. The non-*GlobalGAP*-certified areas are following GAP practices, but the infrastructure needed for the certification programme is not yet in place.

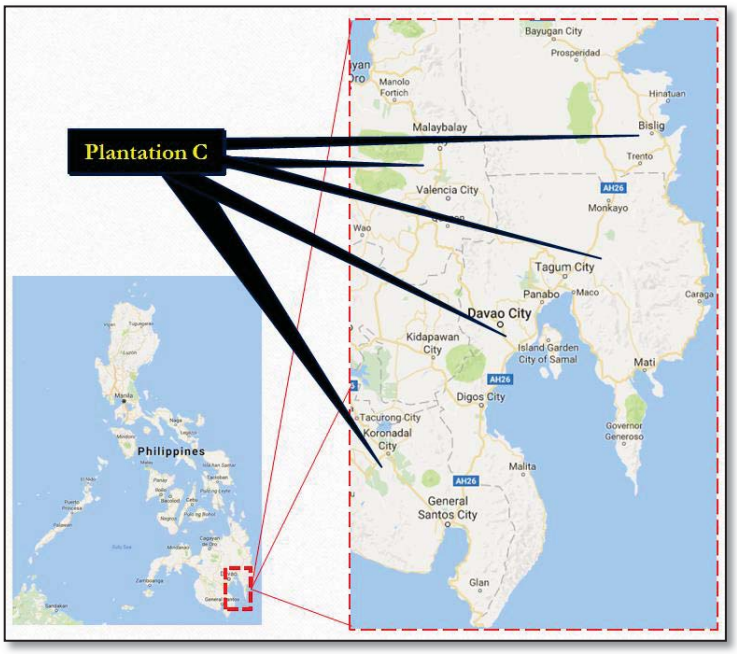


Figure 20. Map of the Philippines (Google Maps, 2016), magnifying Mindanao Island where 'Plantations C's' banana growing areas are located.

Table 7. Land distribution of 'Plantation C' for managed farms and contracted grower areas.

Land Coverage	Corporate-managed Farms	Contract Grower Areas
Total area	6,500 ha	6,500 ha
Highland areas	3,250 ha	1,300 ha
Lowland areas	3,250 ha	5,200 ha
GlobalGAP-certified areas	6,500 ha	200 ha
PhilGAP-compliant areas	6,500 ha	≥ 200 ha

Figure 21 shows the high-level management structure of 'Plantation C'. It is headed by a general manager who oversees the whole operation including both managed farms and contracted grower areas. Reporting to the general manager are the COO, the research director and the chief financial officer (CFO). The 10 district managers who supervise the activities in their districts, the 32 packing station managers who manage the packing facilities, and the agricultural services managers who provide technical assistance to both managed farms and contracted grower areas report to the COO. Reporting to the research director are the different group heads of the Entomology, Plant Pathology and Agronomy departments. Reporting to the CFO are the human resources manager who is responsible to look after recruitment and employee welfare, the purchasing manager who is responsible for the acquisition of assets and supplies, and the accounting manager who is responsible for monitoring company expenses and payment collections. 'Plantation C' employs approximately

20,000 people for both the corporate-managed farms and the support services that include the contract grower areas. However, most of the workers in the field are outsourced from labour service providers or manpower agencies.

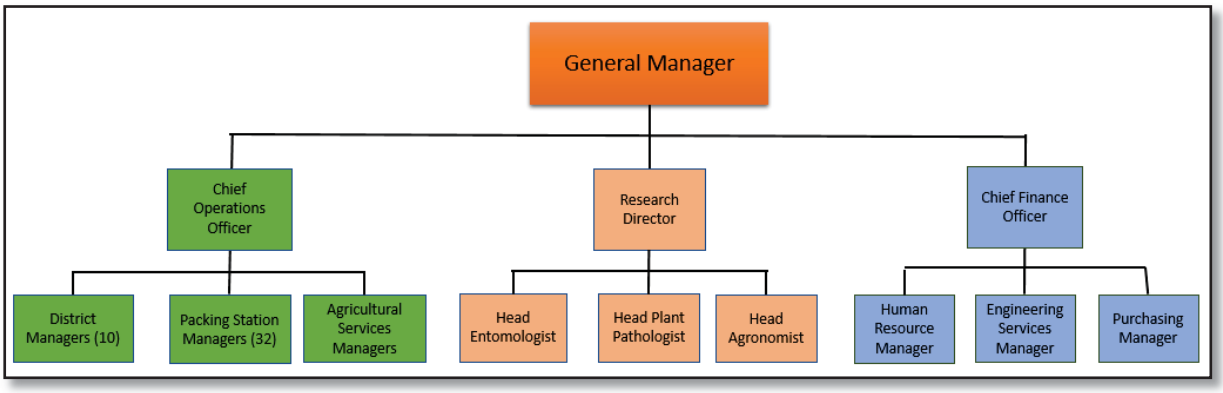


Figure 21. The high-level management structure of 'Plantation C'.

The bananas produced from 'Plantation C' are sold to Japan, Korea, China, New Zealand, the Middle East and Singapore under their own brand. In fact, 30% of the Cavendish bananas sold in the Japanese market come from this plantation. Their customers from Japan and Korea require them to present *GlobalGAP* certificates for all bananas by 2019, although non-*GlobalGAP*-certified bananas are still acceptable prior to 2019.

5.4.2.2 Plantation D

'Plantation D' is Filipino-owned institutional buyer. It is a company that was set up in the 1970s to produce and export bananas. Over the years, it has expanded to a total area of 6,000 hectares that produce 20 million boxes of bananas annually. The plantation areas are distributed across four provinces in Mindanao Island, namely: Davao del Sur, Davao del Norte, South Cotabato and North Cotabato (Figure 22). As with 'Plantation C', this plantation has corporate-managed farms and contracted grower areas (Table 8). The managed farm has 154 hectares of highland bananas and 4,013 hectares for lowland bananas. Among the managed farms, only 600 hectares of lowland bananas have *GlobalGAP* certification and this occurred in 2015. In 2016, they applied to certify another 150 hectares of highland bananas. Nonetheless, all operations are aligned with *ISO 9000* and follow GAP, although no certification process has taken place. Despite the absence of a certification procedure, bananas grown in the managed farms and produced in the contract grower areas are exported to Japan, Korea, China, Singapore, Hong Kong, Iran and Dubai under the company's own brand.

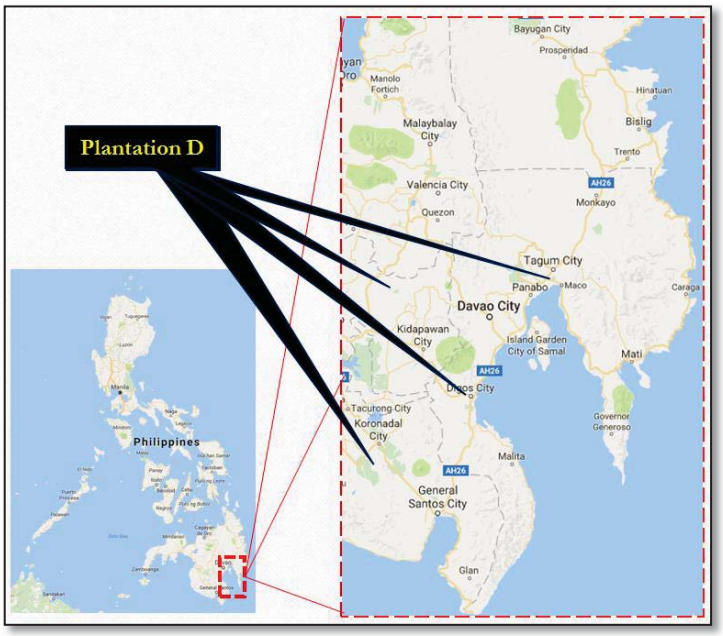


Figure 22. Map of the Philippines (Google Maps, 2016), magnifying Mindanao Island where 'Plantation D's' banana growing areas are located.

Table 8. Land distribution of 'Plantation D' for managed farms and contracted grower areas.

Land Coverage	Corporate-managed Farms	Contract Grower Areas
Total area	4,167 ha	1,833 ha
Highland areas	154 ha	Not provided
Lowland areas	4,013 ha	Not provided
GlobalGAP-certified areas	600 ha	None
PhilGAP-compliant areas	≥ 600	Not known

'Plantation D' is run by a corporation that is mainly focused in the production of tropical fruit such as bananas and pineapple. A top-level management structure is presented in Figure 23. It is headed by a chairman and chief executive officer (CEO), and under them a vice-chairman. Reporting to the vice-chairman are the chief operating officer (COO) and chief finance officer (CFO). The head of the banana production and services operation reports to the COO, while the respective heads of human resources, manufacturing plants and purchasing report to the CFO. The company employs about 6,000 people, of which 150 of them perform managerial functions.

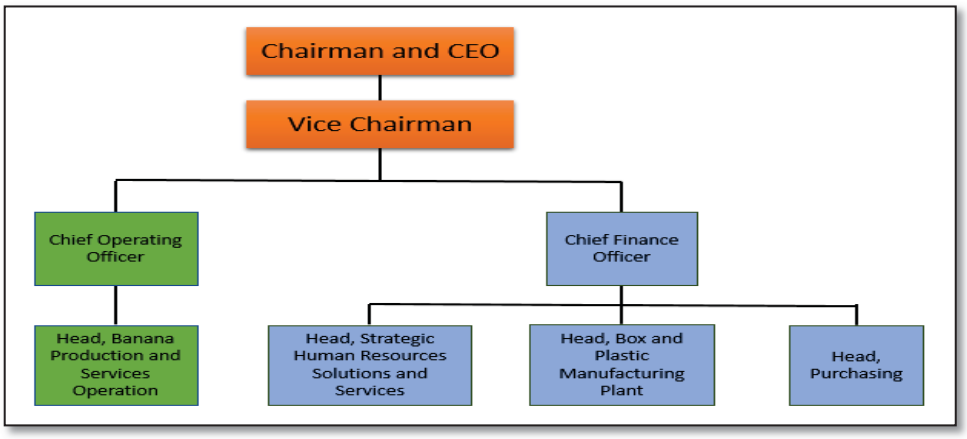


Figure 23. The high-level management structure of 'Plantation D'.

5.4.3 Type 3: Non-adopters of the *PhilGAP* Certification Programme Who Have Not Implemented Other Forms of QMS Certification

Five independently operating banana plantation companies participated in this research under Type 3. However, it was decided to remove three interviews of the respondents becase these did not provide additional insights about the phenomenon of interest compared to the first two respondents. Thus, only two companies were analysed in detail and coded as 'Plantation E' and 'Plantation F'. Both plantations are situated in a contiguous section of land located in the province of Davao del Norte (Figure 24).

5.4.3.1 Plantation E

'Plantation E' is owned and run by a family that engages in banana production only, on a 75-hectare lowland banana plantation. It is located adjacent to another 25-hectare banana plantation, which is also leased and managed by the family. In addition, another five hectares of lowland bananas in a different province were acquired by the family recently and are now under its management. The plantation can produce up to 60 boxes of bananas per hectare per week, which are exclusively sold to a licensed exporter, coded as 'Exporter A'. The bananas purchased by 'Exporter A' are sold to the Chinese market as long as they meet the phytosanitary and chemical residue requirements. The areas farmed by 'Plantation E's' owners used to be leased and managed by a multinational institutional buyer, coded as 'Plantation X', until it was devastated by a typhoon in 2005. It was then managed by the current owners upon termination of the leasing contract. Unlike the previous respondents, the management structure of 'Plantation E' is not hierarchical because all decisions are made by the owner. 'Plantation E' employs a total of 100 people that are a mostly hired on a casual basis and most of them come from other banana plantations. The company does not belong to an association of banana growers and it is heavily reliant on market and regulatory information provided by the licensed exporter. Among the participating plantations in this research, 'Plantation E' is the only plantation that allowed the researcher to walk around the farm to make field observations. This is

because the participant was not aware about what constitutes a *PhilGAP* certification process and they wanted the researcher to assess if they were capable of participating in the *PhilGAP* certification programme. A description of the field observation is presented in the succeeding paragraphs.

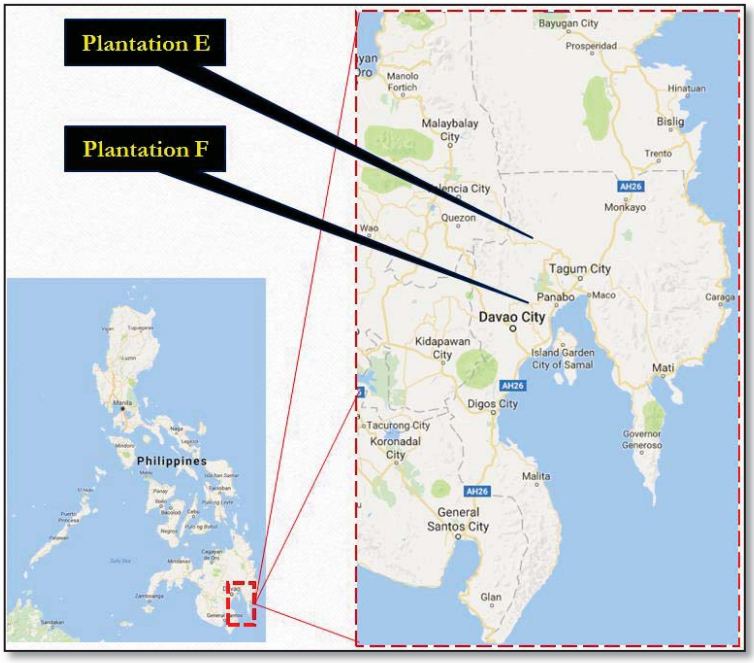


Figure 24. Map of the Philippines (Google Maps, 2016), magnifying Mindanao Island where 'Plantations E and F' are located.

The following description was obtained from the field observation on 'Plantation E', something not possible on the other plantations. It provides some insights into the QMS they use. 'Plantation E' is enclosed by improvised fences but guarded with a sturdy metal gate (Figure 25). The entrance gate has an armed security guard who regulates the entry and exit of people to the plantation. The entrance has a foot bath facility to quarantine possible pathogens coming from outside to the plantation. To enter the gate, workers need to present an identification card and wear a uniform as required. The gate is situated one kilometre away from the packing facility, through a rough road where bananas are planted left and right (Figures 26).

'Plantation E's internal operations are based on the management processes used by the previous company, 'Plantation X'. Bananas from the field are brought to the packing plant through a cable way and inspected according to desired specifications (Figure 27). After inspection, banana hands are removed from the bunch (Figure 28). Then bananas are placed in washing pool filled with flowing clean water (Figure 29). As the bananas reach the other side of the pool, they are weighed and sorted according to the specifications or rejected if they do not meet them (Figure 30). The bananas that pass the specifications are packed in a box with the aid of a blower or vacuum (Figures 31 and 32). In each step, bananas are regularly inspected for damage and rejected if not up to standard.

Figure 25. Entrance gate at 'Plantation E' (Author, 2016).

Figure 26. Rough road inside 'Plantation E' where bananas are planted left and right (Author, 2016).

Figure 27. Bunches of bananas brought to the inspection area through a cable way (Author, 2016).

Figure 28. Banana hands are removed from the bunch after it has been inspected (Author, 2016).

Figure 29. Bananas are placed in a washing pool filled with flowing clean water (Author, 2016).

Figure 30. Bananas are weighed and sorted according to specifications or rejected if they do not meet them (Author, 2016).

Figure 31. The bananas that pass the specifications are packed in a box with the aid of a blower or vacuum (Author, 2016).

Figure 32. Vacuum-packed green bananas protected with pads (Author, 2016).

'Plantation E' also maintains a record of the farm operations (Figure 33) and provides resting and meeting facilities for workers (Figure 34). In addition, liquid organic fertiliser inputs are properly stacked in a sheltered area (Figure 35).

Figure 33. A record showing the weekly monitoring of pesticide operations and the results of the harvest (Author, 2016).

Figure 34. Meeting or resting facility (Author, 2016).

Figure 35. Storage facility for liquid organic fertiliser products (Author, 2016).

5.4.3.2 Plantation F

'Plantation F' is owned and run by a family corporation that is engaged in the buying, growing and exporting of Cavendish bananas. The corporation owns a 70-hectare lowland banana plantation established in 1994 and produces an average of 5,000 boxes of bananas annually. They were a contract grower for 'Plantation X' from 2001 to 2010, but then became an independent operation in 2011. Aside from growing bananas, it has also expanded its business and buys bananas from a number of smaller lowland banana growers (203 hectares), which are then on-sold into the export markets.

'Plantation F's management structure is headed by a president and CEO, to whom managers in different divisions are reporting (Figure 36). The export operations manager oversees the export market operations including the sourcing of bananas. The production manager supervises the daily production operations in the corporate-owned banana plantations. The farm consultant provides technical support to the farm operations such as pesticide usage and agronomic practices. The finance manager deals with the financial obligations of the company, while the human resources manager deals with the recruitment and training of employees. The company employs 17-18 people in the office and 80 others in the field. The company is also member of a smaller association of banana exporters and growers.

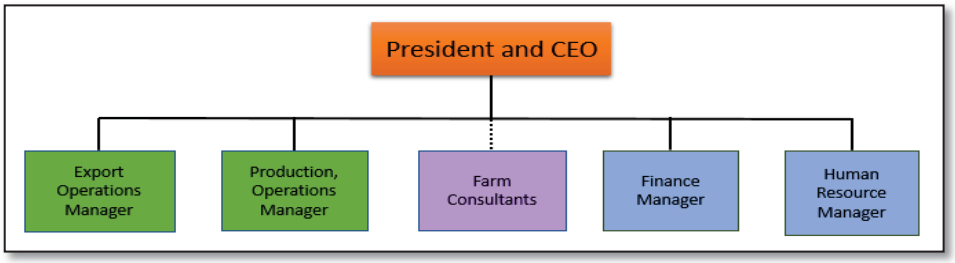


Figure 36. The high-level management structure of 'Plantation F'.

As a former contracted grower of 'Plantation X', the company follows the QMS used by 'Plantation X' and maintains or improves the facilities in the plantation. The internal QMS is aligned with *ISO 9000*, although the company did not undertake the certification process. In addition, the farm consultant who used to work in 'Plantation C' and 'Plantation X' recommends annual improvements in the plantation practices to meet customer requirements. There are no certification requirements from their customers in Japan, Korea, China and the Middle East, as long as the product complies with their standards for pesticide residues and phytosanitary requirements. In order to provide a general view of the plantations characteristics in each type of adopter or non-adopter, the follow section provides a comparative summary of the contextual factors.

5.5 Comparison of Farm Characteristics

The purpose of this section is to present the tabulated summary of the contextual factors that are relevant to the adoption of the *PhilGAP* certification programme in the Cavendish banana plantations (Table 9).

Table 9. Comparison of farm characteristics.

Contextual Factors	Plantation Type 1		Plantation Type 2		Plantation Type 3	
	A	B	C	D	E	F
Total size, hectares	6,640	> 485	13,000	6,000	105	273
Production system						
Lowland	6,640	> 485	3,250	> 4,013	105	273
Highland	0	0	3,250	154	0	0
Management of farms						
Own-management	6,640	> 485	6,500	4,167	80	70
Contract growership / leasing	0	0	6,500	1,833	25	203
Type of ownership	Corporation	Corporation	Corporation	Corporation	Family	Corporation
Type of actor	Grower	Grower	Grower & exporter (institutional buyer)	Grower & exporter (institutional buyer)	Grower	Grower & exporter (institutional buyer)
No. of employees	10,000	Not stated	20,000	6,000	100	98
Membership to association	Yes, PBGEA	Yes, PBGEA	Yes, PBGEA	Yes, PBGEA	No	Yes, small group
Current QMS certification (year certified)	*PhilGAP* (2012), *GlobalGAP* (2013)	*PhilGAP* (2014)	*GlobalGAP* (2009)	*GlobalGAP* (2015)	None	None
Current QMS alignment	*ISO 9000, ISO 14000*	*ISO 9000, ISO 14000*	Not stated	*ISO 9000*	None	*ISO 9000*
Markets	Japan, Korea, Middle East, China, Singapore, Hong Kong, New Zealand and Malaysia	Middle East, Japan and Korea	Japan, Korea, China, New Zealand, the Middle East and Singapore	Japan, Korea, China, Singapore, Hong Kong, Iran and Dubai	China	Japan, Korea, China and the Middle East

5.6 Summary

The *PhilGAP* certification programme was developed in 2005 to: 1) facilitate the adoption of GAP to ensure food safety and product quality, while also ensuring environmental protection and the health, safety and welfare of workers; (2) produce safe and high quality agricultural crops for consumers; and (3) facilitate access for agricultural crops from the Philippines to neighbouring ASEAN markets and other foreign markets. The process of certification is managed by the GAPCC that comprises the chairperson, vice-chairperson, permanent members, commodity-based members, secretariat and other members from selected divisions of the Department of Agriculture. The BAFS serves as the chairperson, while its technical staff serves as the secretariat of the programme. The directors,

executive directors, and national programme coordinators of different selected government agencies under the Department of Agriculture serve as members of the GAPCC. The certification process involves: (1) the submission of documents by the applicant to the regional office of the Department of Agriculture; (2) field inspection of the farm; (3) the review, evaluation and validation of documents and inspection reports; (4) endorsement for approval by the Department of Agriculture secretary; and (5) issuance of the certificate if approved.

In the Philippine Cavendish banana plantations there are two companies that have adopted the *PhilGAP* certification programme ('Type 1' respondents). They completed the *PhilGAP* certification process and are coded as 'Plantations A and B'. Both plantations are owned by a large corporation. 'Plantation A' covers 6,640 hectares planted contiguously with Cavendish bananas while 'Plantation B' covers a fragmented area of at least 485 hectares. 'Plantation A' obtained its first *PhilGAP* certificate in 2012, while 'Plantation B' became *PhilGAP*-certified in 2014.

Two types of non-adopters were identified during the study. These were banana plantations that have not adopted the *PhilGAP* certification programme, but have implemented another form of QMS certification, normally *GlobalGAP* ('Type 2' respondents), and banana plantations that have not adopted the *PhilGAP* certification programme nor have they implemented other forms of QMS certification ('Type 3' respondents). There were two participating banana plantations under 'Type 2', which are both growers and exporters (institutional buyers) of bananas. 'Plantation C' is owned by a multinational company that farms 13,000 hectares; their 6,500 hectare managed farms started to participate in *GlobalGAP* certification in 2009 and they have been fully certified since 2014. On the other hand, 'Plantation D' is owned by a local company that farms 6,000 hectares, but only 600 hectares have been *GlobalGAP* certified since 2015. Both 'Plantations C and D' are following a generic GAP for their non-certified areas, although the certification process was not yet initiated.

Lastly, five independently operating banana plantation companies participated in this research as 'Type 3' respondents. However, it was decided not to include the interviews from three of these plantations because they did not contribute additional insights to those provided by the first two 'Type 3' respondents. Thus, only two companies were analysed in detail and coded as 'Plantation E' and 'F'. The former is owned and managed by a family that only engages in growing bananas from their 105-hectare lowland banana-growing areas. On the other hand, the latter is owned and managed by a corporation that is also engaged in buying, growing and exporting bananas from a 273-hectare plantation.

This chapter provided the context of the case specifically for *PhilGAP* and its certification process, and the profile of the different participating plantations. The responses of these plantations, when it comes to the adoption of the *PhilGAP* certification programme, are presented in the next chapter.

Chapter 6: CASE RESULTS

6.1 Introduction

This chapter presents the findings from the case study that investigated the adoption and non-adoption of the *PhilGAP* certification programme by Cavendish banana plantations. The study investigated three different types of adopters of the programme among Cavendish banana growers whose produce is exported to international markets. This chapter explores the research questions: (1) Do the same barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations identified by Banzon et al. (2013a) still exist or have new drivers and barriers emerged since the initial study in 2011?; (2) How have these barriers continued to limit the adoption of, or how have these drivers led to the adoption of, the *PhilGAP* certification programme by Cavendish banana plantations in the Philippines?; and (3) Why do some Cavendish banana plantations adopt and continue to participate in the *PhilGAP* certification programme despite these barriers?

The results chapter is divided into four main sections. Section 6.2 presents the adoption process used by both the adopters and non-adopters of the *PhilGAP* certification programme. At the end of this section, a comparison between the *PhilGAP* and *GlobalGAP* certification process is presented because *GlobalGAP* could be both a barrier and driver to the adoption of *PhilGAP* certification. Section 6.3 presents the different challenges in implementing public standards that are related to the *PhilGAP* adoption and certification programme. Lastly, Section 6.4 provides a summary of this chapter.

6.2 The Adoption Process for the *PhilGAP* Certification Programme

The Cavendish banana plantations were classified into three types on the basis of their adoption (or non-adoption) of the *PhilGAP* certification programme. These were: (1) banana plantations that have adopted the *PhilGAP* certification programme and are therefore *PhilGAP*-certified or Type 1; (2) banana plantations that have not adopted the *PhilGAP* certification programme, but have implemented other forms of QMS certification, normally *GlobalGAP* or Type 2; and (3) banana plantations that have not adopted the *PhilGAP* certification programme nor have they implemented other forms of QMS certification or Type 3.

The adoption process proposed by Rogers (2003) provides a valuable tool for the structural analysis of the adoption or rejection of the *PhilGAP* certification programme. Each stage in the adoption process has a rejection point and, as such, this lens provides insights into the barriers to, and drivers of, the adoption of the certification programme. Each stage can either lead on to the next stage or it can stop if the grower rejects the technology at a rejection point. The stages include: (1) Knowledge; (2) Persuasion; (3) Decision; (4) Implementation; and (5) Confirmation. The following sections present the adoption process for each type of adopter or non-adopter of the *PhilGAP* certification programme.

6.2.1 Adoption of *PhilGAP* Certification Programme by 'Plantation A' (Type 1 Respondent)

The purpose of this section is to descibe the adoption process undertaken by 'Plantation A' for the *PhilGAP* certification programme. Prior conditions at 'Plantation A' fostered the adoption of the *PhilGAP* certification programme. For example, through its *ISO 9000* and *ISO 14000* schemes introduced in 2000, 'Plantation A' already had in place protocols for the quality management of Cavendish bananas. It had developed an internal QMS manual and established forms that included guidelines for plant care, fruit care, disease control, irrigation and drainage, fruit processing and packaging. They used spray diaries to keep a record of their spray programmes and computer software to track the bananas from the production site to the market. A further pre-condition was the belief that if it wanted to retain access to international markets it had to achieve *GlobalGAP* certification. For this reason, the main goal of 'Plantation A' in 2010 was to obtain *GlobalGAP* certification.

The management team at 'Plantation A' could foresee that market access would be a problem in the future if *GlobalGAP* certification was not achieved because alignment of the farm operations with *ISO 9000* and *14000* was not sufficient. The management team at 'Plantation A' believed that *PhilGAP* certification could be a useful means by which the company could transition towards *GlobalGAP* certification. Thus, the goal of obtaining *GlobalGAP* certification to ensure future international market access was the primary driver for the adoption of the *PhilGAP* certification scheme for 'Plantation A'. The following paragraphs describe the events that led to the adoption of the *PhilGAP* certification through the lens of Rogers' (2003) adoption process.

6.2.1.1 The Knowledge Stage

The knowledge stage of Rogers' (2003) adoption process is where farmers become aware of the innovation and gain an understanding of how it works. In 2010, the vice-president for Research, Information and Compliance of 'Plantation A' attended a local forum of banana growers about the different issues in the banana industry. During the forum, the speaker mentioned *PhilGAP* as an aside. Prior to this, the vice-president had not heard about the *PhilGAP* certification programme. Thus, he did further research on how to participate in the certification programme through their local networks in the government. His cognitive understanding of the programme was used to decide whether it was a useful tool to achieve their goal of obtaining *GlobalGAP* certification. The knowledge generated at this stage was used to create a perception about the programme as explained in the next stage.

6.2.1.2 The Persuasion Stage

The persuasion stage (Rogers, 2003) is where farmers develop either a positive or a negative perception of the technology. This stage is also referred to as the interest stage where an individual develops an interest about the technology, and has enthusiasm to seek further information and scrutinise its application to their current situation. The vice-president of 'Plantation A' instructed his QMS team to conduct a gap analysis between the then current internal QMS and the requirements for

both the *PhilGAP* and *GlobalGAP* certification programmes. As such, the head of the QMS department, 'Participant 1', and his team checked the compatibility of the *PhilGAP* certification requirements against their internal QMS. They recognised that their *"internal QMS were also not at par with that of PhilGAP"* and that the "*PhilGAP certification standards are not at par with GlobalGAP standards"* (Participant 1). So if they wanted to upgrade from their current operations to *GlobalGAP* standards, they needed to assess internally what they had to improve. To do this, they compared their internal QMS against the *PhilGAP* standards, and then used the *PhilGAP* standards as a "*springboard to GlobalGAP*" certification (Participant 1).

The initial gap analysis by the QMS department revealed four key areas where improvements were required in the current internal QMS if 'Plantation A' was to meet *PhilGAP* standards. These were: (1) product quality, (2) food safety, (3) environmental sustainability and (4) workers' welfare. To meet the standards for product quality, 'Plantation A's' pack house control procedures had to be improved. Similarly, to meet *PhilGAP* food safety requirements, some areas related to food hygiene in the pack house had to be improved. These included the proper use of hairnets by staff and the placement of safety nets over the conveyor belts to reduce contamination. In addition, they had to improve the practices in their pollution and waste management system related to addressing environmental sustainability issues. This included a thorough monitoring of water and air quality, and the disposal of wastewater used for washing the personal protective equipment (PPE) contaminated with pesticides in a specialised septic tank. Likewise, they had to improve the workers' health, safety and welfare. These improvements included the provision of additional toilets within the farm parcels for use by workers, training in the proper use of personal protective equipment and general equipment to reduce the risk of chemical exposure and accidents, refurbishment of workers' resting places, and the replacement of expired first aid kits and worn out safety sign posts.

After completion of the gap analysis in the first quarter of 2011, 'Plantation A's' management team started to work on the improvements of the identified areas to see if they could apply for *PhilGAP* certification. The management team had to convince themselves and the plantation workers to participate in the certification programme because any objection from members of the management team or the workers could hinder its adoption.

The management team had engaged the involvement of other divisions in the company to assist in obtaining *PhilGAP* certification. This was viewed as a complex but systematic exercise. In the previous years, the Engineering Division repaired and renovated their facilities based only on the available budget, but the inclination to participate in the programme during that time compelled them to prioritise company spending based on *PhilGAP* requirements. The Agriculture Division of the company had also enhanced the existing internal QMS. It appeared that many of the processes the company had in place were not being implemented correctly. Forms and reports were not filled in

correctly or consistently over time and some data was missing. As such, details on chemical and fertiliser use were incomplete and workers failed to sign the forms for various activities. Thus, the enhancements included a more detailed and consistent recording of spray diaries. Staff were asked to provide complete information on chemical applications and to sign off once they had completed a pesticide application. Centralised mixing of chemicals was also imposed to minimise the exposure of workers to concentrated and more toxic substances. Likewise, workers consistently undertake their routine activities all year round. Pest monitoring was improved, which included ensuring mousetraps were baited and a record of mouse kills was recorded. Proper hygiene practices were introduced including the use of full hairnets and handwashing with soap and water. Safety nets were consistently placed above the packing plant to avoid contamination.

At the same time, the Human Resource Division of 'Plantation A' supervised the improvement in workers' welfare by: (1) providing one toilet for every 60 hectares along with washing facilities containing pictograms depicting proper handwashing techniques; (2) developing pleasant resting places for workers during shift breaks; (3) ensuring up-to-date first aid kits were available at all work sites; (4) assessing farm tools on a regular basis to prevent minor cuts or injuries; (5) providing regular training to all workers to ensure they have adequate skills and knowledge; and (6) organising the periodic replacement of sign posts that set out best practice guidelines. The company also funded an annual medical check-up of workers who are directly involved in the use of pesticides to have their blood cholinesterase levels monitored annually. The medical records and cholinesterase test results of staff would be reviewed annually by *PhilGAP* inspectors as a requirement of the certification programme.

The changes organised by 'Plantation A' were relatively minor because the existing QMS aligned with *ISO 9000* and *ISO 14000* was reasonably compatible with the *PhilGAP* certification programme. The company's improvement in the internal practices does not necessarily translate to the adoption of the *PhilGAP* certification programme. 'Plantation A' could have implemented the changes in the practices aligned with *PhilGAP*, but it cannot be validated unless they apply for the *PhilGAP* certification programme. They could also have decided to go directly with *GlobalGAP* after the changes has been made. Although the management of 'Plantation A' assumed that the quality of their produce had improved by following the *PhilGAP* standards, they were not really sure until a certification programme was undertaken.

6.2.1.3 The Decision Stage

The decision stage (Rogers, 2003) is where farmers take part in activities that can lead to the adoption or rejection of the innovation. 'Plantation A' decided to apply for the *PhilGAP* certification programme because any plantation can claim to be compliant with *PhilGAP* but it cannot be validated unless practices are audited and inspected. Thus, the company prepared all the documents needed for

the PhilGAP certification programme. By participating in the programme, the company ensured that the product quality preferred by the customers was met. Thus, maintaining a business reputation as a producer of quality bananas is another driver for the adoption of the *PhilGAP* certification programme.

> So we thought, PhilGAP fills the gap between what the customer wants and what we can provide. Because for us, we can say that [our product] is safe already, our workers are in good condition, we take care of the environment, or our products are good. But who says it? [It is] just us. So we have to have somebody or third party who will say that "yes, [Plantation A] is doing that" … The thing with PhilGAP is [that it deals with the] product quality, food safety, environmental protection, workers' health, safety and welfare. So, the four elements are there. So even if we say [to our customers] that we also have that, without PhilGAP certificate, who will believe us? That's only us, isn't it?... We were not too sure if all of our operations are [on the] standard already or have met the [certification] requirements. So that's it, we had [decided to undertake] PhilGAP certification… (Participant 1).

6.2.1.4 Implementation Stage

The implementation stage (Rogers, 2003) is where the innovation is applied and put into use. In October 2011, the company applied for the *PhilGAP* certification programme for all of the 16 stations on 'Plantation A'. They had not tried the programme in a few stations because they were using a standard QMS across stations and there was no certification cost for adding another station. They submitted the documents needed to evaluate their plantation practices and they had been notified about a field visit by the *PhilGAP* inspectors. At this stage, 'Plantation A' consistently implemented the changes they had made to all the stations. Although they were confident that they would pass the first application for *PhilGAP* certification, they still recognised the risk of being denied certification despite their thorough preparation.

In November 2011, the *PhilGAP* inspection team made an announced visit to the plantation and assessed their compliance on the control points. The team was composed of representatives from BAFS, BPI, FPA, DOLE and DENR. As part of the certification process, the team obtained banana samples proportional to the number of chemicals used in the plantation. The samples were then analysed for microbial and chemical residues. This service is free and one of the benefits of the programme, otherwise 'Plantation A' would have tried the programme for a few selected stations only, or proceeded directly with *GlobalGAP* certification if the *PhilGAP* certification cost was more expensive. The results of the analysis were provided to 'Plantation A'. The free inspection services of the *PhilGAP* certification programme that come with free microbial and chemical residue analyses provided an additional driver for 'Plantation A' to participate in the certification programme.

6.2.1.5 Confirmation Stage

The confirmation stage (Rogers, 2003) is when the farmer seeks reinforcement of the decisions made. In February 2012, 'Plantation A' received its first *PhilGAP* certificate signed by the secretary of the Department of Agriculture. It meant that they had acceptable practices in compliance with the

PhilGAP certification programme as validated by the inspection and results of the chemical residue analysis. Although the company had obtained *PhilGAP* certification for its banana crop, they did not include the *PhilGAP* logo on their product labels. This is because the customer does not require such a logo in the label. Instead, the *PhilGAP* mark is indicated in the sales invoice or receipt only as a reference for the retailer because of the nature of business-to-business transactions. Nonetheless, 'Plantation A' received an appreciation letter from a Japanese supermarket for undertaking the *PhilGAP* certification programme as an assurance of a safe and high quality product.

The perceived benefits of participating in the certification programme were also realised at this stage. Although there was no relative advantage in terms of a premium price and increased productivity for the *PhilGAP*-certified bananas, they observed improvements in the performance of their workers in terms of hygiene practices, and an increased level of safety awareness as reflected by the reduction in the number of accidents and health problems. The additional inspection from the *PhilGAP* team was viewed as a validation by the company that they were doing the right thing because someone of higher authority, apart from the company, was checking them.

In addition, 'Plantation A' found that *PhilGAP* serves as a repository for other government requirements because the practices stipulated in *PhilGAP* are aligned with the policies of other government agencies. For example, the guidelines for *PhilGAP* include proper storage, and the methods for correct application and disposal of fertilisers and pesticides. These areas are also monitored by the FPA. Thus, compliance through the *PhilGAP* certification programme also meets the compliance requirements of the FPA. In addition, the DENR inspects the environmental impacts of the plantation. These are also covered in the Environmental Sustainability module of the *PhilGAP* programme. This is useful to 'Plantation A' because compliance with *PhilGAP* requirements can also lead to compliance with other government regulations. This benefit was also viewed as one of the other drivers for 'Plantation A's' adoption of the *PhilGAP* certification programme.

> This is what the customer likes, we [Plantation A] also like it…but it's not just us. [Other government agencies like] FPA, DA, DENR, all of them have requirements. The FPA, [asks] about the pesticides. The DA, they also have inspections, they come over for a visit. The DOLE [Department of Labor and Employment does] same thing. So it is not just really about to address the customer who eats [the product], but there are also other interested [government] parties. So if you look at the *PhilGAP*, other parties can be addressed as well. FPA, because they have questions in *PhilGAP* like "Is your warehouse registered?" And the registration is from FPA. So if we comply with the laws in the Philippines, there are really compliance already in the *PhilGAP* (Participant 1).

Once the company achieved *PhilGAP* certification in 2012, it initiated the implementation of *GlobalGAP* into its QMS. In 2013, the company obtained *GlobalGAP* certification for 'Plantation A'. However, it has continued to use the *PhilGAP* certification scheme. This is because other banana growers looked up to them, and maintaining the *PhilGAP* certification programme can influence

others to adopt the programme to improve product quality, food safety, environmental sustainability and workers' health and welfare. Through their influence in the industry, *PhilGAP* certification can also help the Philippine government in reducing the risks of dealing with rejected bananas in the export market because of excessive pesticide residue or the presence of pests. This is important to 'Plantation A's' management team because it could protect the country's banana industry in general or the company's business reputation in particular as a producer of high quality bananas. Furthermore, the additional inspection from the government ensures that they are producing high quality bananas as reflected in the company's vision for *"Total Quality"* bananas (Participant 1).

Participation in both the *PhilGAP* and *GlobalGAP* certification programmes is driven by management. It entails costs which the management should be willing to invest. Aside from the material costs, it also includes the time cost of changing the attitudes of workers towards the specific requirements of the programme.

> It's not possible if the person who spends the cost will not be the one to decide that we do *PhilGAP* or *GlobalGAP*… because there is really some cost. Even if there is no charge for the inspection, but complying with the standards, even the minimum standards only… they really need to invest… So you have to make them understand that it is really a requirement for the workers. It's not requirement because it is a requirement for the purpose by itself, but because, heaven or hell can still wait for them. So we have to maximize our stay on earth so we have to control. It's not because they require us, but because required to wear it well. That's why we have our quarterly refresher course to still encourage them…

As a result of their successful adoption of the *PhilGAP* certification programme on 'Plantation A', the company also implemented changes aligned with *PhilGAP* on 'Plantation B' in 2013 and obtained *PhilGAP* certification in 2014. Since then, both plantations have continued to participate in the *PhilGAP* certification programme through the annual renewal of its certificates, which requires an annual inspection. The management team at 'Plantations A and B' is very proactive in participating in the *PhilGAP* certification programme. On the other hand, there are varying responses among the participating plantations of the non-adopter type. In the next section, the events that led to the non-adoption of the *PhilGAP* certification programme using the same lens will be described.

6.2.2 The Rejection Process for Non-adopters of the *PhilGAP* Certification Programme (Types 2 and 3 Respondents)

There are two groups of banana growers that were identified as non-adopters of the *PhilGAP* certification programme. These were banana plantations that have implemented other forms of QMS certification, normally *GlobalGAP* (Type 2 respondents), and banana plantations that have not implemented other forms of QMS certification (Type 3 respondents). Participating plantations under Type 2 are *GlobalGAP* certified. The standards for *GlobalGAP* are compatible with *PhilGAP*, but they are normally more stringent. These plantations would be able to obtain *PhilGAP* certification if they applied for certification. 'Plantation C' and 'Plantation D' are Type 2 respondents. The former

had been participating in *GlobalGAP* since 2009, while the latter started in 2015. On the other hand, participating plantations under Type 3 are using in-house QMS that are not externally certified. The standards of these QMS systems are lower than *PhilGAP* or *GlobalGAP*. Thus, if these plantations wanted to obtain *PhilGAP* certification, they would need a considerable upgrade in their QMS. These include 'Plantation E' and 'Plantation F'. Their existing QMS were drawn from the production practices of other companies. The following sections describe the events that led to the rejection process of *PhilGAP* certification programme under Type 2.

6.2.2.1 Type 2: Non-adopter of the PhilGAP Certification Programme Who Have Implemented Another Form of QMS Certification, Normally GlobalGAP

Knowledge Stage

The *PhilGAP* certification programme was not actively promoted to Cavendish banana plantations until the vice-president of 'Plantation A' was invited to a *PhilGAP* promotion caravan launched by the government through BAFS in 2015. Thus, the level of awareness of the *PhilGAP* certification programme within the banana industry was low until 2015. The promotion was open to all plantations, but the government tended to focus its effort on growers who were members of large associations or groups. The representatives of 'Plantation C' and 'Plantation D' attended one of the promotion seminars where the vice-president of 'Plantation A' presented their experiences with the programme. From this seminar, they learned about how to participate in the programme and the principles behind the *PhilGAP* certification programme. However, these plantations had been participating in the *GlobalGAP* certification scheme and because it is the gold standard QMS for international markets, they did not consider it relevant to their business. Both representatives from 'Plantation C' and 'Plantation D' developed a selective perception that the *PhilGAP* certification programme was a "redundancy" to their existing QMS certification scheme or a "waste of exercise" (Participants 2 and 3).

Persuasion Stage

Despite a preconceived notion that the *PhilGAP* certification programme was redundant because of the existing QMS, 'Participant 2' reported the information he obtained about the *PhilGAP* certification programme through the promotion seminar to the management team at 'Plantation C'. When they compared *GlobalGAP* to the *PhilGAP* certification process, they found that 80% of their *GlobalGAP* practices matched those used in *PhilGAP*. However, *PhilGAP* was not required by their export market, rather they wanted *GlobalGAP*-certified bananas. Although *PhilGAP* was 80% compatible with their existing QMS certification programme, 'Plantation C's management team believed that there was no relative advantage to be gained from their participation in the *PhilGAP* certification programme. In addition, 'Participant 2' perceived that the implementation of the *PhilGAP* certification as a government programme could be a problem for the company. This is because previous experience with government programmes had highlighted problems due to a lack of

"coordination" between the national and the regional offices of the Department of Agriculture. This lack of coordination among government agencies is a barrier to the adoption of the certification programme.

In contrast, 'Parcticipant 3' did not investigate the *PhilGAP* certification programme further, nor did he report it to the management team at 'Plantation D'. This was because the *PhilGAP* certification programme was not recognised by 'Plantation D's' export markets and 'Participant 3' could see no benefit from adopting it. Because 'Plantation D' was already implementing the *GlobalGAP* certification programme, the gold standard, he believed that the quality of its produce would exceed that obtained under the *PhilGAP* certification programme.

> So [although] companies are practising it, *PhilGAP* also took the practices of *GlobalGAP*, it seems they are aligned. But the market requirement is more on the *GlobalGAP*, so not on *PhilGAP*. So we can say that the practices of *PhilGAP* are being adopted by the companies. But during the certification, they don't apply because they don't need it (Participant 3).

In addition, 'Participant 3' perceived that a public GAP programme can be problematic because of a perception about the lack of independence in the government's programmes. This is another barrier to the adoption of the programme. 'Participant 3' believed that a person of greater authority in the government could influence the result of the local inspections. As such, a company who initially failed the certification process could become certified through political influence.

> Because of the inspectors in *PhilGAP*, it seems organized by the government agencies, so most likely, it appears political. The heads of agencies, whoever they want to become inspectors, they appoint as inspectors. So, it seems there is doubt on the integrity of the inspectors, because the inspectors are members or officers or employees of the agencies involved. So they can be influenced by the head of the agency. That is one difference with the inspector of *GlobalGAP*. Because for *GlobalGAP*, really coming from the outside (Participant 3).

Decision Phase

At this stage of Rogers' (2003) process, the management of 'Plantation C' and 'Plantation D' take part in activities that can lead to the adoption or rejection of the *PhilGAP* certification programme. Since the corporate-managed farms of 'Plantation C' were fully certified with *GlobalGAP*, they did not foresee any relative advantage from obtaining *PhilGAP* certification. They also intended to be fully *GlobalGAP*-certified for their contract growing areas by the end of 2018. However, they do not prohibit their contracted growers participating in the *PhilGAP* certification programme and they are willing to provide them with technical assistance if they want to do this. Nonetheless, the corporate-managed farms actively rejected participation in the *PhilGAP* certification programme after assessing its relative advantage against their current practice and also based on the perception that government programmes lack coordination.

Likewise, 'Plantation D' does not intend to apply for *PhilGAP* certification because it was not required by the international market and they had concerns about the lack of independence with the government certification process. They intend to continue to adopt the *GlobalGAP* certification with the aim of certifying a further 154 hectares of highland bananas in 2016. They had not conducted an assessment of the *PhilGAP* certification programme and the decision was made on the basis of their perception that *GlobalGAP* is a better standard than *PhilGAP*. Hence, the *PhilGAP* certification programme was passively rejected by 'Plantation D'. The following paragraphs describe the events that led to the non-adoption of the *PhilGAP* certification programme under Type 3.

6.2.2.2 Type 3: Non-adopter of PhilGAP Certification Programme Who Have Not Implemented Other Forms of QMS Certification

Knowledge Stage

Participants from 'Plantation E' and 'Plantation F' were not aware of the *PhilGAP* certification programme because the promotional caravan did not reach to them. They had not received any information or been invited to a promotional seminar on *PhilGAP*. 'Plantation E' does not belong to a grower association while 'Plantation F' is a member of a small association of banana growers. As such, neither were targeted by the government's promotional seminars. They have limited knowledge on what constitutes good agricultural practices such as the proper use of pesticides based on their existing QMS, but not about *PhilGAP* or its certification process. When asked if they were familiar with *PhilGAP*, 'Participant 5' responded *"Not at all… I really don't know*", while 'Participant 6' answered positively with a "*Yes"*. However, when 'Participant 6' was asked for further information about the policies of *PhilGAP* he responded *"Not so much"*. He was aware that training on GAP in general is a requirement to become an accredited grower but he was not informed specifically about *PhilGAP* and the certification process. He also asked for more information about *PhilGAP* and the certification process from the researcher. Both growers stated that if they were given enough information about PhilGAP and the certification process, they would be willing to adopt it. The growers from 'Plantations E and F' were not able to assess the merits of adopting the *PhilGAP* certification programme because of a lack of awareness – a key barrier to the adoption of the programme.

The results from this study show that a plantation's decision to participate in the *GlobalGAP* certification programme can either drive the adoption of the *PhilGAP* certification programme, as in the circumstance of 'Plantation A', or it can hinder the adoption of *PhilGAP* certification, as in the case of 'Plantation C' and 'Plantation D'. Some authors in the literature also argued that public and private QMS certification programme can co-exist (Gunningham & Rees, 1997; Raymond & Bonnaud, 2014) while others argued that they compete with each other (Lockie et al., 2014). For these reasons, a comparison between the *PhilGAP* and *GlobalGAP* certification processes based on the experience of 'Plantation A' is presented in the next subsection.

6.2.3 Comparison Between the Characteristics of *PhilGAP* and *GlobalGAP*

A comparison of the compliance criteria between *PhilGAP* and the previous version of the *GlobalGAP* certification programme was performed by 'Participant 1'. He found that 70% of the compliance criteria of the *GlobalGAP* were present in *PhilGAP*, and that they needed to comply with the remaining 30% using the previous version to be *GlobalGAP*-certified. The number of compliance criteria in *GlobalGAP* changes yearly during the annual *GlobalGAP* Summit. Although the practices were not discussed in detail, Table 10 shows the comparison of the characteristics between the two certification programmes based on the experience of 'Plantation A'.

Table 10. Comparison between *PhilGAP* and *GlobalGAP* certification programmes based on the experience of 'Plantation A'.

Areas	*PhilGAP* Certification	*GlobalGAP* Certification
Scope	Philippines	Global
Certifier	Government (DA, BPI, BAFS)	Private – certifying body
Modules	Food safety	Food safety
	Environmental protection	Environmental protection
	Workers' health, safety and welfare	Workers' safety and welfare
	Product quality	Animal welfare
Inspection schedule	Announced – annual	Announced – annual
		Unannounced – annual
Inspector's transportation cost	Paid by the government	Covered in the certification fee
Inspection coverage	Whole plantation at random	Square root of the plantation at random
Compliance level	Major	Major
	Minor	Minor
	Recommended	Recommended
Confirmation lead time	Three months	28 days
Standard operating procedures	Written form like notebook, not necessarily in English	Wall calendar is acceptable as minimum requirement
Toilet requirement	Every 500 metres or 80 hectares	Reach within seven minutes
Washing facility	Checklist with soap, water and towel and pictograms for proper way of washing	Checklist with soap, water and towel and pictograms for proper way of washing
Training with workers	Annual	Annual
Stray animals	Must not be present in the station	Must not be present in the station
Physical facilities	Must be presentable	Must be presentable
Sign posts / location markers	Present	Present
Chemical residue analysis	Inspector take samples during the inspection	Inspector reviews the chemical residue analysis performed by an accredited laboratory with *ISO 17025*

Record of spray diaries	Complete chemical details; signed by the applicator	Complete chemical details; signed by the applicator; include climatic conditions
Risk assessment	Absent	Present

PhilGAP and *GlobalGAP* are both QMS being implemented by 'Plantation A' to ensure high quality Cavendish bananas. The former is developed and implemented in the Philippines by the Department of Agriculture and its attached agencies such as BAFS and BPI, while the latter is developed by an international private entity and implemented by a private certifying body. Both QMS contain four modules in which three of them share the same principles, namely: food safety, environmental protection, and workers' health, safety and welfare. However, *PhilGAP* has a product quality module, but the *GlobalGAP* has animal welfare module. The former checks the superiority of the product or if there is a grading system required by the end-user. The latter does not check this because it is a business-to-business model, in which the buyer checks the quality according to their desired specifications. In addition, *PhilGAP* has an annual plantation inspection that is pre-arranged. In contrast, *GlobalGAP* has two inspections per year where one is pre-arranged and the other is an unannounced visit. The government pays the certification costs for *PhilGAP*, whereas the plantations need to pay a fee to cover the certification cost for *GlobalGAP*.

For both QMS, 'Plantation A' is given a month to prepare for an announced visit. However, 'Plantation A' is only given 48 hours to prepare for unannounced visit for *GlobalGAP*. Often, the unannounced notification is sent on a Friday, which does not give the management and workers much time to prepare for the inspection.

The coverage of the inspection varies for each QMS. For example, on 'Plantation A', for *PhilGAP*, the whole plantation is randomly inspected, which takes four days' work from a team of six inspectors. On the other hand, *GlobalGAP* inspects the square root of the whole area only or an area equivalent to four stations if a standard QMS is operating across the 16 stations. Otherwise, *GlobalGAP* inspects the whole area if there is no standard QMS for all areas. Nonetheless, it takes four days to complete the inspection due to more detailed criteria being checked by only two inspectors from an accredited *GlobalGAP* certifying body. After a certain period, the certifying body is audited by the *GlobalGAP* management to ensure that the inspection was properly conducted. Such audit processes are not present in *PhilGAP*.

The level of compliance in both QMS is continuously evolving, and they have developed a checklist with 'Major Must', 'Minor Must' and 'Recommended' criteria. During the first year of adoption of

'Plantation A' in the *PhilGAP* certification programme there was no checklist, but the *PhilGAP* secretariat provided "*vague requirements and it's up to you to interpret"* (Participant 1). The pass rate was not clear, but the grower was certified if most of the criteria were met. With the recent inspection, a checklist containing questions answerable by '*yes'* or '*no*' was provided. However, the framing of the questions was also not clear and open to interpretation. The answers to the questions must be '*yes'* to be compliant with the criteria, while a non-compliance would have to be marked with a '*no'*. 'Participant 1' argued that a '*no'* answer does not necessarily mean non-compliance. For example, the question *"Is re-use water used for post-harvest operations?"* could be answered by a '*no'* to be compliant, or by a '*yes'* if there is a water treatment prior to use. In contrast, the *GlobalGAP* certification programme has always used a checklist with clearly framed questions, but the criteria changes as the programme is refined. The number of '*yes'* responses to meet the compliance criteria are counted. A 'Major Must' needs to have full compliance, a 'Minor Must' must have at least 95% compliance, and a 'Recommended' does not require compliance. However, during an annual *GlobalGAP* summit, some 'Recommended' criteria were elevated to 'Minor Must' and some 'Minor Must' criteria became a 'Major Must'. Thus, 'Plantation A' aims to comply with all the required criteria as much as possible. Due to time constraints, the checklists for both QMS that contain the detailed compliance criteria were not assessed by the researcher.

> Our VP for Agri once said that we should all treat them as Major Must. Meaning, we should comply with all because the Minor Must, there is an allowance… Because after some time, they will make it Major Must because it changes every time (Participant 1).

To validate the compliance of a plantation for both QMS, a certificate is provided at the end of the evaluation period. However, *PhilGAP* takes approximately three months to release the certificate due to problems with the coordination of the different government agencies involved in the endorsement of the certificate to the secretary of the Department of Agriculture. The *PhilGAP* guidelines suggest that the certificate should be provided within 30 days. In contrast, *GlobalGAP* provides the outcome of the evaluation within 28 days from the date of inspection. If there are criteria that are not complied with, corrective actions must be undertaken and reported within 28 days from the date of inspection. Once everything is complied with, the application is approved through the release of a certificate. Otherwise, the application is denied.

> If within 28 days, especially in Major Must in GlobalGAP, 100% of the Major Must control point should be complied. If you have not complied at least one, you cannot be certified. In Minor Must, you must have at least 95% of the Minor Must that are applicable in the farm must be complied. If less than 95% then you cannot comply within 28 days, they will not give the certificate (Participant 1).

There are some notable differences in the criteria between the two QMS. For example, *GlobalGAP* requires more detailed content in the spray diaries including the climatic conditions. In addition,

GlobalGAP does not obtain banana samples for chemical residue analysis. Instead, they inspect the results of a plantation's chemical residue analysis that must be conducted by a laboratory that has *ISO 17025* certification. Thus, the plantation must pay for the cost of the analysis for *GlobalGAP* whereas *PhilGAP* provides free chemical residue analysis.

In the next round of certificate renewal, a new risk assessment module will be required in the latest version of the *GlobalGAP* certification programme. This module is not used in *PhilGAP*. In the previous version of *GlobalGAP*, a risk assessment was required in relation to the effects of their internal operations on the external environment, such as communities in nearby areas. In the latest version, the effects of the external environment on a plantation's internal operations must also be assessed. For example, the presence of a mining facility in the adjacent area, in which chemical by-products can contaminate the plantation, or the presence of the fungal pathogen *Fusarium oxysporum* (tropical race 4) in adjacent plantations.

Implementing both public and private GAP standards can be both challenging and rewarding for growers. On the other hand, it can also be challenging for the implementing institution because the system does not always work the way it was designed. The next section presents the challenges faced by the government agencies in implementing public standards such as *PhilGAP* for Cavendish bananas.

6.3 The Challenges Faced When Implementing Public Standards

Although BAFS is the secretariat for the implementation of the *PhilGAP* certification programme, the BPI-Plant Quarantine Services (PQS) provides training on GAP in general to banana growers, packing facilities, traders and exporters as a requirement for mandatory accreditation of these groups in Mindanao. The generic GAP training programme was designed to ensure product quality for bananas but it did not necessarily address the key areas required to meet the *PhilGAP* standards. Thus, the certification programme is not covered in these training modules. As a result, the BPI-PQS inspectors have limited opportunity to check whether the practices discussed in the GAP training were correctly and consistently implemented during the production phase. This is because the BPI-PQS inspection only covers the period from harvesting until departure of the product at the port.

> There is a training being conducted by BPI to the exporters and growers as our participants. It was not thoroughly explained that they can apply for GAP certification. They need to be certified. Although the topic had been discussed but the message was not really strong or firm, that it is needed and works to their advantage when they are certified. In our discussion, that is my realization (Participant 9).

Despite the immediate mandatory regulation to be accredited by BPI-PQS, not all growers, traders, exporters or packing facilities have complied with the requirements for accreditation. These four groups of stakeholders were made aware of the requirements through public announcements of the

BPI-PQS Memorandum Numbers 40 and 41, but they don't comply so they don't apply for accreditation. As such, they cannot legally export bananas. Thus, the BPI-PQS can only inspect, monitor and audit those who apply for accreditation according to the two memorandums, but it does not have full control at all (Participant 9). Certification becomes a problem when there are actors in the industry that seemingly operate legally when actually they do not. It is complex in such a way that there are too many areas and linkages to consider with respect to the implementation of GAP.

> The banana industry is like a web. Too many areas. Now if you will concentrate on GAP alone, it will also affect the sources and causes why it is not implemented well. It has a very wide scope. At least there, you can see the complexity (Participant 9).

There are "splinter groups" or group of actors such as growers, packing facilities, traders and growers that are not accredited for their business operations, and are therefore not monitored by the government (Figure 37). Yet, some accredited packing facilities, traders and exporters still buy bananas from non-accredited growers. There are also instances when accredited traders and accredited exporters allow non-accredited traders and/or exporters to use their licences so that non-accredited groups can sell the bananas directly to the export market through royalty payments. This situation distorts the traceability of the bananas from the grower to the export markets. Nonetheless, there is no local regulation preventing the use of royalty payment arrangements.

> Then, we cannot stop it [royalty] because it is their agreement. Unless there is an ordinance, that royalty is prohibited. Because for us, it's just really the product itself [bananas] (Participant 9).

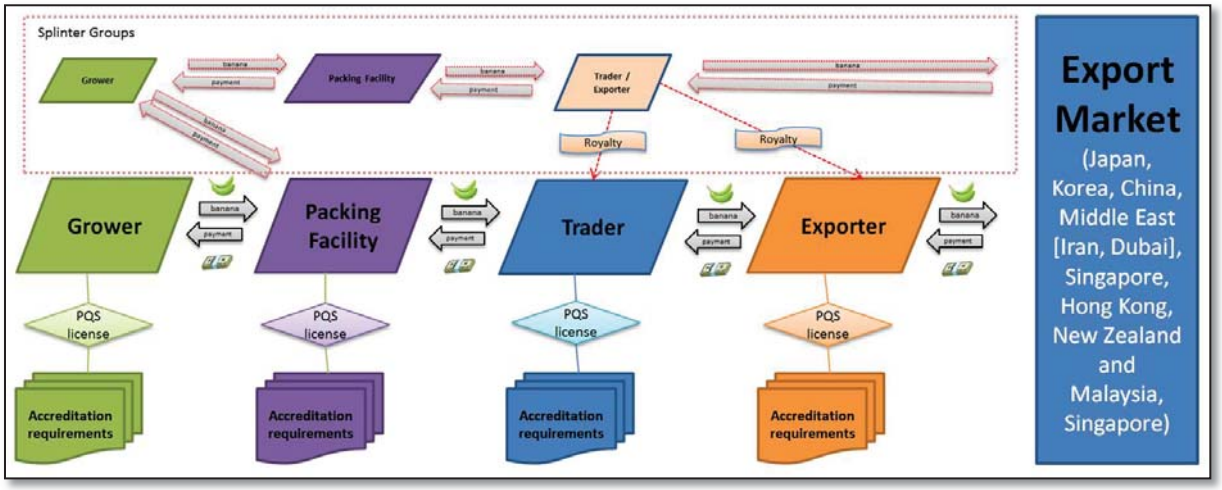


Figure 37. Simple model showing the relationship of different groups of actors, including the splinter groups, in the banana export industry.

Another problem arises when a grower does not agree with the results of the inspection. Most growers abide by the standards, as it is better for them to be rejected at the BPI-PQS inspection level than in the export market. A set of corrective actions can be undertaken to obtain accreditation after the initial inspection. However, there are opportunity costs such as the time and resources that could have been

spent in processing new batches of bananas. In such cases, the bananas have to be reprocessed. The reprocessing process can downgrade the quality of the bananas from Class A (flawless bananas) to Class B (slightly bruised bananas). Class A bananas command a price twice that of the Class B bananas in the export market (Participant 7). Because of the potential losses associated with reprocessing bananas, inspectors are often verbally abused and threatened by growers who have failed the certification process.

> Sometimes, the farmer will ask you, "why will you not approve this? It is still ok". He will tell you it is his income at stake. But when the inspector says that "it cannot pass this one or that", they will sharpen a blade in front of you… If the grower has a money, he may have guns, they might pull the trigger… Don't stay that long and leave immediately… (Participant 7)

> That's why for us, during inspection, we don't wait until sunset. Because when you are inside the plantation, it's really difficult to get out, especially when you rejected their bananas… (Participant 9)

There are also situations where an accredited grower who is contracted to provide bananas to an exporter, defaults on the contract and sells the bananas to another exporter for a higher price. This process is called "pole-vaulting". The grower and exporter enter into a supply contract for a fixed period of years. The former is required to sells the bananas to the latter at a fixed price. On the other hand, the latter is expected to provide technical assistance and financial support to the former that may include the repair and maintenance on the infrastructure, chemical inputs and personal protective equipment, depending on their agreement. However, some growers opt to sell either the whole harvest or a portion of the harvest to other exporters who can offer a higher price (Participants 2, 6, 7 and 9). The price of bananas in the market is not constant and fluctuates weekly, so some growers look for other exporters who can provide the best price. For example, the grower sells 70% of the harvested fruit to the contracted exporter at a contract price of PHP 400/box (US$ 8/box), and then he declares 30% as damaged or rejected, but in reality 30% of the harvest is sold to another exporter at PHP 800/box (US$ 16/box). Although this situation affects the traceability of the bananas from growers to the export markets, BPI-PQS does not have the mandate to control this problem. As long as the growers comply with the requirements, BPI-PQS issues a phytosanitary certificate that is a documentary requirement for every export shipment.

> Although we are doing some kind of accreditation that, your grower should be registered with the Quarantine. We cannot really prohibit the grower from giving the bananas to other exporters because it is not within our mandate (Participant 9).

The disagreements from the farmers about what constitutes quality, the presence of the splinter groups, and pole-vaulting activities have challenged the enforcement of the two mandatory regulations that partially cover GAP implementation. The situation calls for the Local Government Unit (LGU) to be involved in the monitoring and inspection of the banana-growing areas (Participant

9). The LGU issues local permits and community tax certificates to the growers after conducting local inspections. They are also located within the same town or province within the production areas. However, there can be a number of financial and technical constraints due to the different resources and capacities of various LGUs. Some LGUs are very much engaged in the promotion of GAP while some others are not.

> There is an ongoing proposal that the LGU (Local Government Unit) will have a deputation from the Bureau of Plant Industry, that they will be the one to police the issue [pole-vaulting] … Because that is the jurisdiction of the barangay level because they have the knowledge of the banana growers in the area. So at least, they will have a look out over there. Because for us, the scope is on the national or general look out… So it's really better if LGU will take over because the papers that they need to process are within their vicinity already. If the LGU will monitor them, it will be faster… Sometimes, the problem with other LGU's is that they don't have budget. It has long been an idea for years to go with the LGU that it should be like that but it did not push through because of lack of budget… and even their technical person, we really don't know if they are really technical (Participant 9).

> When it comes to the regions, before, ah, GAP [*PhilGAP*] was not the priority of the regions. When we were establishing the regional GAP [*PhilGAP*] units, they had more, before they were not aware of GAP [*PhilGAP*], but now they are already becoming more aware of GAP [*PhilGAP*], and we have trained them in GAP [*PhilGAP*], and now we have a better relationship with the regions when it comes to GAP [*PhilGAP*] promotions… But these are funded, their salaries are under the LGU and not under DA. And that's another constraint. The LGU, this is another job, an added function for them. And they don't get an added monetary value for their activities. Since these activities are under the DA. They can't provide added salary, only the LGU salary. (Participant 10)

Financial and technical constraints are critical factors in implementing any regulation, and can therefore affect how *PhilGAP* is interpreted and adopted. A resource-rich LGU could provide extensive training and promotion for *PhilGAP* while a resource-poor LGU could have limited activities related to training and promotion.

Although GAP in general is being promoted by the BPI-PQS in the two memorandums, the limited promotion of *PhilGAP* and its certification programme remains a problem. It does not provide options for the growers to participate voluntarily in the *PhilGAP* certification programme. As a result, growers have either not heard about it, or they have misconceptions about it. These include: (1) it is difficult to implement; (2) it is expensive; (3) they confuse it with organic production; (4) they must record the farm practices in a computer; and (5) they must build new facilities when they can actually use the household facilities or portable toilets. At the time of data collection, the implementation of the *PhilGAP* certification programme was in a transition phase from BAFS to BPI. The new implementing rules and regulations (IRR) were drafted and finalised, but the document was not provided to the researcher. Nonetheless, the proposed IRR still includes free certification services to the growers and a reduction in the bureaucracy to hasten the release of the certificate to the applicant (Participant 13). In addition, the members of *PhilGAP* certification committee will be within the same

agency, which makes it easier to coordinate (Participant 10). The Crop Research and Production Support Division (CRPD) and Plant Product Safety Services Division (PPSSD) will serve as the programme secretariats, and both are under the BPI. The former will be responsible for auditing, while the latter will do the farm inspections (Participant 9). Then, the BPI director will sign the *PhilGAP* certificate instead of the Department of Agriculture secretary (Participants 10 and 11).

6.4 Summary

Cavendish banana plantations can be classified into three types on the basis of their adoption (or non-adoption) of the *PhilGAP* certification programme. These were: (1) banana plantations that have adopted the *PhilGAP* certification programme and are therefore *PhilGAP*-certified or 'Type 1' respondents; (2) banana plantations that have not adopted the *PhilGAP* certification programme, but have implemented other forms of QMS certification or 'Type 2' respondents; and (3) banana plantations that have not adopted the *PhilGAP* certification programme nor have they implemented other forms of QMS certification or 'Type 3' respondents. The different types of adopters portrayed different responses to the *PhilGAP* certification programme, in which Rogers' (2003) adoption process was used as a lens to evaluate the case of interest.

The events that led to the adoption of *PhilGAP* certification programme in the 'Type 1' plantations (adopter) were examined and viewed through the adoption process from its prior conditions to the different stages of Knowledge, Persuasion, Decision, Implementation and Confirmation. There were perceived benefits and costs in participating in the certification programme. The tangible benefits include free certification services and free microbial and chemical residue analysis. Other perceived benefits are improvements in food quality, food safety, environmental sustainability and workers' health, safety and welfare. The *PhilGAP* certification was also seen as stepping stone to *GlobalGAP*, and this was seen as essential long term to ensure market access. The perceived compliance costs include on the installation of new facilities such as toilets and resting places, and additional training for workers among others. The *PhilGAP* certification process is perceived as complex, but because 'Plantation A' and 'Plantation B' had other QMS in place, it was not difficult to change and the process was relatively compatible with what they did. The certification process is also triable but they chose not to test it in one zone or farm because all zones follow a standard QMS, and certification for all zones does not entail additional cost. Thus, the company pursued the application for the *PhilGAP* certification programme because the perceived benefits outweighed the perceived cost.

The primary driver to adoption was to use *PhilGAP* as a springboard to achieve *GlobalGAP*, an internationally recognised market standard for QMS. Nonetheless, the company continues to participate in *PhilGAP* after having been certified with *GlobalGAP* because they want to ensure the production of a *"Total Quality"* banana to protect their business reputation – another driver of adoption. The company's participation in the certification programme can influence other banana

growers to adopt the more affordable and accessible programme to improve product quality, food safety, environmental sustainability and workers' health and welfare. As a producer of a fresh food product, the additional inspection from the government can verify quality requirements that they may have missed. Another driver of the adoption of the *PhilGAP* certification is that it satisfies other government requirements that regulate industry operations. For example, the DENR inspects the environmental conditions of the plantation, which are also present in the Environmental Sustainability module of *PhilGAP*. Thus, compliance with *PhilGAP* requirements can also lead to the compliance for other government regulations. Lastly, *PhilGAP* certification is provided as a free service. As such, 'Plantation A' (and 'Plantation B') obtain a free assessment of their internal practices including microbial analysis and chemical residue analysis for all pesticides used on the plantation. 'Plantation A' and 'Plantation B' continue to participate in it because perceived benefits were actually gained in the process of adopting the *PhilGAP* certification programme.

For the 'Type 2' plantations (non-adopter), participating plantations were aware of the *PhilGAP* certification programme, but they decided not to adopt it because they were currently participating in the *GlobalGAP* certification scheme. This is the market standard for QMS for export bananas and is seen as a higher standard than *PhilGAP*. 'Plantation C' has participated in *GlobalGAP* since 2009, while 'Plantation D' started in 2015. Although they are practising the principles stipulated in *PhilGAP*, engaging in a *PhilGAP* certification process is viewed as redundant to their existing QMS certification scheme or a "waste of an exercise". As such, a key barrier to the adoption of *PhilGAP* is the competing technology *GlobalGAP* which is perceived to have a higher standing with export markets. If a plantation has a *GlobalGAP* certification, it is unlikely to adopt *PhilGAP*. They did not perceive any relative advantage from participating in the *PhilGAP* certification programme because this certification programme is not required in the international market. In addition, the perceived lack of coordination and perceived lack of independence in the government process makes it even more problematic for the plantations to participate in the programme – another barrier to adoption. 'Plantation C's' previous experience revealed that policies at the national government level are not properly coordinated with the regional government units or the LGUs. In addition, they perceived that the result of inspections made at the local or regional level can be influenced by a person of greater authority in the government. Thus, they opt to participate in the *GlobalGAP* certification programme rather than *PhilGAP*.

For the 'Type 3' plantations (non-adopter), participating plantations have varying levels of awareness about the *PhilGAP* certification programme. They have limited knowledge of what constitutes GAP in general such as proper use of pesticides based on their existing QMS, but not the *PhilGAP* and its certification process. An interview respondent from 'Plantation E' had not heard about *PhilGAP* while a respondent from 'Plantation F' had heard of generic GAP training but not about *PhilGAP* and its certification process. Thus, participating plantations under Type 3 were not able to assess the merits of

the *PhilGAP* certification programme because of the lack of awareness – a key barrier to the adoption of the programme.

The results from this study show that the plantations' decisions to participate in the *GlobalGAP* certification programme can either drive the adoption of *PhilGAP* certification, as in the circumstance of 'Plantation A', or hinder the adoption of this certification, as in the case of 'Plantation C' and 'Plantation D'. Some authors in the literature also argued that public and private QMS certification programme can co-exist while others argued that they are competing with each other. For these reasons, a comparison between the *PhilGAP* and *GlobalGAP* certification processes was also presented in this chapter. Results showed that both the public and private *GAP* certification programmes can co-exist and can be implemented simultaneously by the same entity. The grower can benefit from the implementation of both public and private *GAP* certification programmes but it could also be challenging sometimes. Likewise, the implementing institutions could also encounter problems during the implementation of the programme because the system does not always work the way it was designed.

The *PhilGAP* certification programme is implemented by the Bureau of Agriculture and Fisheries Standard. However, the BPI-Plant Quarantine Services also provides a generic GAP training to banana growers, packing facilities, traders and exporters as a requirement for mandatory accreditation of their business operations. Their training on GAP was designed to ensure the product quality of bananas. However, the certification programme is not covered in these training modules. As a result, there is a limited opportunity to check whether the GAP training was correctly and consistently implemented during the production phase because BPI-PQS inspection starts only at the harvesting phase until the departure of the product at the port. Hence, problems arose when farmers do not agree with the results of quality inspections. Other challenges include the presence of "splinter" groups and "pole-vaulting" activities that compromise the traceability of bananas. To address these issues, the LGUs are proposed to get involved by monitoring the banana-growing areas. In addition, the implementation of the *PhilGAP* certification programme is in the transition from BAFS to BPI. This aims to improve the process and address issues that could have hindered the adoption of the programme. The transition will not affect the free certification services and free chemical residue analysis. In addition, the promotion of the programme was intensified and the issuance of the certificate was shortened. These are new changes but were not yet implemented at the time of the study.

This chapter provided the results of the case which dealt with the adoption (or rejection) process of the *PhilGAP* certification programme of the different participating plantations and the regulatory challenges of the implementing agencies. The findings in this case are compared to the literature in the next chapter.

Chapter 7: DISCUSSION

7.1 Introduction

A study initiated by Banzon et al. (2013a) in 2011 revealed that there were no Cavendish banana plantations certified with *PhilGAP*. The study also identified the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme. At the completion of that study in 2013, only one Cavendish banana plantation has been added to the list of *PhilGAP*-certified farms. At present, there are only two out of more than 700 Cavendish banana plantation growers that are *PhilGAP*-certified. This thesis revisits the adoption of the *PhilGAP* certification programme for Cavendish banana plantations in the Philippines. The study aims to investigate the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme. The main focus of this chapter is to position the key findings presented in Chapter 6 within the broader literature as this chapter answers the research questions: (1) Do the same barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations identified by Banzon et al. (2013a) still exist or have new drivers and barriers emerged since the initial study in 2011?; (2) How have these barriers continued to limit the adoption of, or how have these drivers led to the adoption of, the *PhilGAP* certification programme by Cavendish banana plantations in the Philippines?; and (3) Why do some Cavendish banana plantations adopt and continue to participate in the *PhilGAP* certification programme despite these barriers?

The discussion chapter begins with a description of the characteristics of the case in Section 7.2. This is followed by Section 7.3 that positions the case with other studies in relation to the adoption of a public GAP QMS. The next section discusses the barriers to the adoption of *PhilGAP* certification programme in Section 7.4 and then Section 7.5 discusses the drivers of the adoption of the *PhilGAP* certification programme. Lastly, Section 7.6 provides the summary for this chapter.

7.2 Characteristics of the Case

The purpose of this section is to describe the intrinsic features of the case to provide a context in which the findings can be interpreted and compared to other studies. The case is characterised by plantation agriculture and its participation in a public voluntary QMS. The case is composed of different groups of actors such as growers, traders, exporters, and government regulators. Each group of actors has a different context-dependent interpretation of quality and how to achieve certain quality attributes (Morris, 2000). These actors are intricately linked in non-linear, messy and complicated networks. Most banana growers operate independently from other banana growers and exporters, but there are a few instances where small banana growers are dependent on the management practices or recommendations of large banana growers and exporters. Some companies created and joined an association of banana growers and exporters, while other companies do not belong to such groups.

These companies or group of companies are referred to by O'Leary (2005) as institutions that can be characterised according to functions, public or private operations, size and locations.

Following O'Leary's (2005) characterisation, the case study is characterised in a number of areas that are relevant when comparing the results to other studies. Firstly, the farms in this study can be classified as large-scale monoculture plantation agriculture. The majority of farms that grow Cavendish bananas are large and produce a single crop. This contrasts with other studies that may involve small, multiple crop farming systems. The monoculture production system ensures the availability of the fruit for export markets year round as opposed to other fruit crops that are seasonal and are sold in the local market only. Of the 84,000 hectares planted with Cavendish bananas in the country, this research has captured the QMS employed by the participating plantations with a total coverage of 26,329 hectares or 31.44% of the total land area planted. Although qualitative studies do not generally depend on the large numbers of the sample size, the coverage of this study provides sufficient representation of the banana plantations (O'Leary, 2005). Table 11 presents a summary of these key characteristics.

Table 11. Key characteristics of Cavendish banana plantations.

Key Characteristics of Banana Plantations	
Farming type	Large-scale monoculture plantation (84,000 hectares)
Scale of farms	Small scale (0.2 hectares) to large scale (13,000 hectares)
Produce	Perishable fruits
Target market	Export, year-round
Ownership	Mix of private individual grower and corporate owner
Degree of control	Range from independent to dependent to another banana growers, traders or exporters (contract growers)
Capability of growers	Range from low to high
Industry associations	Mix of independent growers, small and large associations
QMS	Mix of in-house, public and private QMS
Mandatory government regulations	BPI Memorandums No. 40 and 41, and other regulations from the national, regional and local government units

The production system is mainly owned and operated by private entities in Mindanao Island. It is complex as it involves specialised operations to meet the minimum quality requirements of the international markets. The operations involve different kinds of technologies to address plant care, fruit care, disease control, fruit processing and packaging among others. The operating procedures vary across plantations and range from lenient to very strict implementation of the guidelines. The extent of company production operations is regulated by public policies at the national, regional and local levels. The public regulations can be mandatory such as BPI Memorandum No. 40 and 41 that covers a general GAP training, or can be voluntary such as the *PhilGAP* certification programme. Both regulations inspect and audit the agricultural facilities and practices implemented at the farm levels. However, the BPI memorandums focus on the harvest and post-harvest practices only, while

the *PhilGAP* certification programme covers all aspects of the plantation operation including that of harvest and post-harvest operations. These operations are contained in the *PhilGAP* modules including food safety, quality, environmental sustainability, and workers' health, safety and welfare. Table 12 presents a summary of the key characteristics of *PhilGAP* certification programme.

Table 12. Key characteristics of *PhilGAP* certification programme.

Key Characteristics of *PhilGAP* Certification programme	
Type of QMS	Public
Nature scheme	Voluntary
Incentives for participation	Training, free certification services, free microbial and chemical residue analysis
Technology characteristic	Complex, labour and capital-intensive technology
Competing QMS	*GlobalGAP*, other private QMS

The following section provides the position of these case characteristics in the literature.

7.3 Positioning the Case in the Literature

There has been limited research conducted on plantation agriculture and its participation in the public GAP standards. This study is positioned to fill the gap in the literature specifically on the adoption of the *PhilGAP* certification programme in the Philippines. The intrinsic characteristics of the Philippine Cavendish banana industry provide insights into the adoption of a public voluntary standard in plantation agriculture that is geared towards export markets. The following section discusses the barriers to the adoption of the *PhilGAP* certification programme in relation to the literature.

7.4 Barriers to Adoption of *PhilGAP* Certification Programme

This research found that implementing generic GAP programmes does not necessarily translate to the adoption of the *PhilGAP* certification programme. Banzon et al. (2013a) reported that there was a high level of generic GAP adoption in the Cavendish banana industry, but they were not *PhilGAP*-certified. This is because of the large number of corporate farms that cater to the export markets. However, it can be argued that grower adoption of the generic GAP cannot be equated to the adoption of the *PhilGAP* certification programme because their practices are not inspected through a certification process. This is the same problem identified by Nabeshima et al. (2015) with *Basic GAP*, a public standard in Japan where there was no inspection or documentary proof to validate compliance to the programme. Thus, Japanese farmers who wanted to validate their compliance to GAP programmes adopted *JapanGAP* which is run by a private entity.

It also can be argued that the Cavendish banana plantations have not adopted the *PhilGAP* certification programme because there are a number of barriers that impede this. This research found seven categories of barriers to the adoption of *PhilGAP* certification programme for Cavendish banana plantations (Figure 38). These barrier categories included: (1) knowledge, (2) cost, (3)

processes, (4) rewards or incentives, (5) scale of farm operations, (6) trade issues in the banana industry, and (7) competition with *GlobalGAP* certification, the gold standard QMS by the industry. Issues within the first six barrier categories were also identified by Banzon et al. (2013a) in 2011. Sub-types of these barriers have also emerged from this research namely: (1) the processes involved in the audit, particularly (a) disagreements on the concept of quality; (b) the lack of coordination, and (c) the lack of independence in the audit process; and (2) the trade issues in the industry, specifically the presence of splinter groups or non-accredited groups of banana growers, packing facilities, traders and exporters. Using the lens of Rogers' (2003) adoption process, these barriers occurred at different stages of the adoption process among the non-adopters, but were overcome by the adopters of the programme. The following sections discuss how these barriers continue to limit the adoption of the certification programme among the non-adopters (Type 2 and Type 3) and why the adopters (Type 1) continue to participate in the programme despite them.

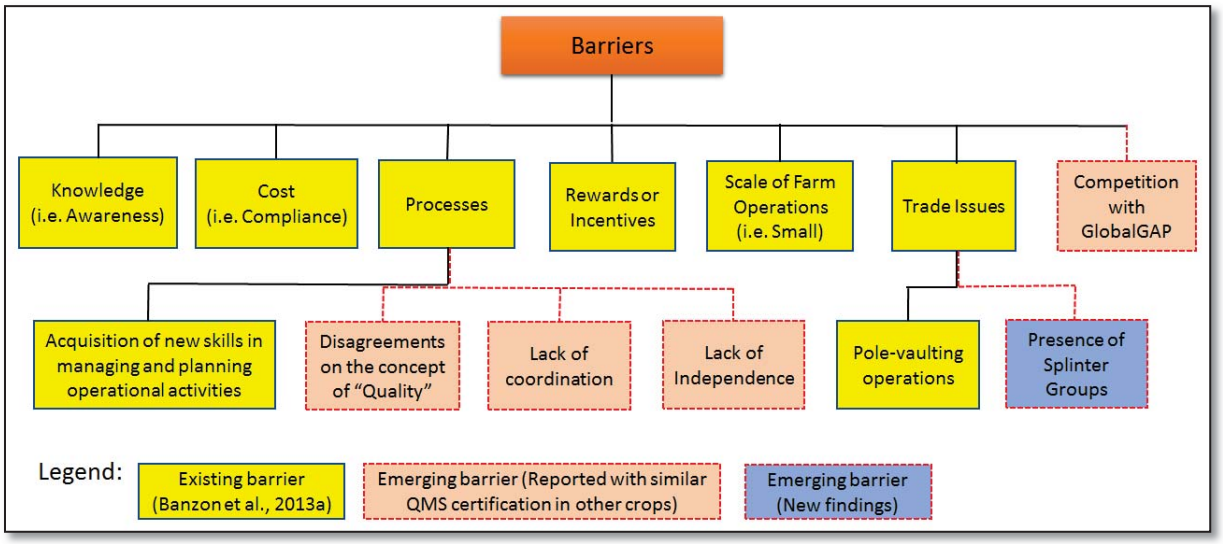


Figure 38. Barriers to the adoption of *PhilGAP* certification in the Cavendish banana plantations.

7.4.1 Knowledge Barriers

This research found that the lack of knowledge as reported by Banzon et al. (2013a) in their 2011 study still remained a major barrier to the adoption of the *PhilGAP* certification programme. Rogers (2003) identified three types of knowledge, namely: (1) awareness knowledge or information that tells of the existence of the innovation; (2) how-to knowledge or the process of how the innovation works; and (3) principles knowledge or the reasons why it works. A key finding in this research was that the 'Type 3' (non-adopter) plantations had little or no awareness of *PhilGAP* certification and those that were aware of the programme had important misconceptions about it. Thus, the how-to and principles knowledge was irrelevant for this type of non-adopter. The awareness knowledge barrier occurred at Rogers' (2003) knowledge stage of the adoption process. The main reason for this was that 'Type 3' plantations did not belong to a large industry association ('Plantation F') or in the case of 'Plantation E', they did not belong to any association. Membership in a large association provided better access to

the relevant information about the programme. Members of the large associations are usually invited to attend seminars organised by the government. This did not occur for smaller associations or for growers who were not members of an association. Thus, membership of large associations provided members with access to wider government networks, which improved their awareness about the government programmes. Rogers (2003) argued that the farmers who are more engaged in social activities or groups have more exposure to mass media and interpersonal channels, and have more networks to change agents. In addition, Srisopaporn (2015) argued that social capital including information sources, membership of farmer groups, and assistance from the government affects farmers' adoption of the GAP programmes. Thus, constant and reliable contact with government extension agents, or other industry actors, could have improved the awareness of 'Type 3' growers the programme.

Moreover, this research found that the generic GAP training provided by BPI-PQS did not provide information about the *PhilGAP* certification process. The generic GAP training could have been used to provide awareness of the *PhilGAP* certification programme, act as an avenue for introducing growers to the principles of, and how to participate in, the *PhilGAP* certification programme. If the farmers or growers were given enough information about the programme, they could have made an informed decision about whether to participate in it or not. Robert and Menon (2007) reported a similar result in his study of the implementation of *VietGAP* where a low adoption rate was attributed to a lack of awareness of the programme.

In contrast to 'Type 3' plantations, this research found that the 'Type 2' (non-adopter) plantations were not constrained by the three types of knowledge. These plantations are members of a large industry association and had been invited by the government to attend promotional caravans. As such, they were able to gain awareness and learned about the process and principles involved in relation to *PhilGAP* certification. For example, 'Plantation C' (Type 2) performed a comparison of the practices between the *PhilGAP* certification programme and their existing QMS – *GlobalGAP*. However, they made an informed decision not to participate in the programme. A similar observation was reported by Srisopaporn et al. (2015) where an informed decision was made by rice farmers in the *QGAP* certification programme. This study highlights that access to good information on the technology, the principles behind it, and how best to implement it, does not necessarily translate into adoption. Other factors such as competition with a superior technology can be more important in the adoption decision.

Similar to 'Type 2' plantations, 'Type 1' (adopter) plantations had full knowledge of the *PhilGAP* certification programme because they actively sought out information through association seminars and workshops, and worked closely with the government before they adopted. They continue to participate in the programme because the knowledge they generated through time was beneficial not

just to the company but also to the government. For this reason, 'Plantation A' (Type 1) was used by the government as a model to promote *PhilGAP* certification in the Cavendish banana plantations. Banzon et al. (2013a) proposed to identify an innovator-adopter of the *PhilGAP* certification to hasten the adoption among the banana plantations. As such, 'Plantation A' served this purpose after having been certified with *PhilGAP*.

7.4.2 Cost Barriers

The second type of barrier to the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) was the cost associated with the programme. They identified two kinds of costs, namely: certification costs, and compliance costs. The certification cost had been waived by the government since 2008 and it also comes with free microbial and chemical residue analysis. Thus, the growers must deal only with the compliance costs such as installation of new facilities, additional training of farm workers on safety and record-keeping, acquisition of more appropriate personal protective equipment, and safety instructions among other things.

For Type 3 (non-adopter) plantations, cost barriers were irrelevant to those growers that were not aware of *PhilGAP*. However, one 'Type 3' plantation was aware of *PhilGAP*, but they had misconceptions about the costs of certification. They believed that the compliance and certification costs were very high and this had an important influence on their decision to reject the technology. As such, this is in effect a knowledge constraint because of the grower's lack of knowledge about the true costs involved in the programme. To point this out, the field observation at another 'Type 3' plantation ('Plantation E') revealed that the farm had already invested in their existing facilities and technologies that could be enhanced given the proper information and openness to participate in the programme. For example, the entrance and exit points to the production area were regulated by a guard who also imposed mandatory quarantine measures to minimise the microbial contaminants in the area. The packing facilities were equipped with cable ways, wash tanks, conveyor lines and vacuums among other materials to ensure the quality of the product. The farm also keeps a record of the farm operations and maintains meeting and resting facilities for workers. The workers are provided with hairnets for hygiene purposes and they are gathered every morning for a short briefing prior to performing the activities for the day. The existing in-house QMS could thereby align with the *PhilGAP* certification programme with little extra cost. It can be inferred that some of the 'Type 3' farms have processes and infrastructure in place so that compliance costs would be minimal if they decided to change to *PhilGAP*. Banzon et al. (2013a) recommended the gradual adoption of good enough practices or the incremental adoption of *PhilGAP* practices. As such, an aggregate adoption or selective components of the programme can be implemented in a few areas (Feder et al., 1985) until all components of the programme are implemented on the farm and become ready for the certification programme.

The 'Type 2' (non-adopter) plantations did not view the costs identified by Banzon et al. (2013a) as a constraint to the adoption of *PhilGAP*, and other barriers were much more important. This was because: (1) some of the costs identified by Banzon et al. (2013a) in 2011 have been paid by the government since 2008, and (2) these plantations have implemented *GlobalGAP*, so they have already covered the compliance costs that would be required should they adopt *PhilGAP* certification. In effect, for 'Type 2' plantations, who have implemented *GlobalGAP*, the cost barriers identified by Banzon et al. (2013a) have been effectively removed.

Similarly, the 'Type 1' (adopter) plantations did not view the costs as a barrier to the adoption of *PhilGAP* certification because the certification cost is met by the government and the compliance cost were costs they needed to invest in to meet quality standards. 'Plantation A' wanted to achieve *GlobalGAP* certification and, as such, any compliance costs required to implement *PhilGAP* were viewed as necessary costs on the way to meeting this longer-term goal. *PhilGAP* certification was used as a stepping stone to achieving *GlobalGAP* certification and, as such, the cost was not viewed as a barrier by 'Type 1' plantations. Amekawa (2009) and Nicetic et al. (2010) reported that participation in *GlobalGAP* requires a more significant amount of investment than the public GAP certification programmes. This being the case, then the financial costs associated with *PhilGAP* are unlikely to limit them from participating in the latter's certification programme. In short, for plantations which had implemented *PhilGAP* or higher quality GAP standards, cost was not a barrier to the adoption and continued participation in the *PhilGAP* certification programme.

7.4.3 Process Barriers

The third type of barrier to the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) was process barriers. Banzon et al. (2013a) reported that banana and mango farmers needed to acquire new skills in managing and planning their operational activities, such as record-keeping of pesticide use and incidence of pests, which can be difficult for some banana growers. In addition, the mango growers complained that there was a lack of coordination among government agencies pushing for *PhilGAP* adoption leading to bureaucratic delays (Banzon et al., 2013a). The following section discusses other sub-types of the process barriers identified in Cavendish banana plantations.

Disagreements on the concept of quality

For 'Type 3' (non-adopter) banana plantations, process barriers were irrelevant because growers were not knowledgeable of the *PhilGAP* certification programme. However, the BPI-Plant Quarantine Services (PQS) undertake a mandatory inspection of the accredited growers' harvesting operations to check the quality of the bananas. Although the quality standards are set by the government, these standards are then interpreted by the growers and they manage their operational activities to achieve these quality standards. This research found that another component of the inspection process might

be a barrier, i.e. the meaning of "quality". For example, a key informant revealed some growers do not agree with the results of the routine inspections carried out by government inspectors as part of the mandatory accreditation process performed by BPI-PQS. This is because the concept of quality is created by the regulators through the compliance criteria and recreated by the growers through the implementation of farm practices, hence, quality is a social construct (Morris & Young, 2004). If the regulators and growers do not agree on what constitutes a socially constructed concept of "quality" for a mandatory accreditation, it can be argued that they are likely to disagree with some of the quality requirements of a voluntary scheme such as the *PhilGAP* certification programme.

For 'Type 2' (non-adopter) plantations, this research identified process barriers at the persuasion stage of Rogers' (2003) adoption process and these continue to limit the adoption of the *PhilGAP* certification programme. These barriers include: (1) a perception that there was lack of coordination among government regulators leading to a long period between inspection and certification, and (2) a perceived lack of independence in the audit process. These are discussed in the following sections.

A perceived lack of coordination among government regulators leading to certification delays

The implementation of the *PhilGAP* certification programme requires coordination with different government agencies within the *PhilGAP* certification committee. Such coordination is common among public GAP certification programmes (Nabeshima et al., 2015; Nicetic et al., 2010; Sarsud, 2007; Wongprawnas, 2015). The *PhilGAP* certification process requires the results of the analysis from accredited laboratories and the endorsements of the inspectors' findings at the regional and national levels to the different members of the certification committee, and then a final endorsement to the secretary of the Department of Agriculture prior to the release of the *PhilGAP* certificate. Problems arise when the members of the certification committee fail to coordinate within the specified timeframe, normally 30 days from the date of inspection. As such, it takes longer to complete the certification process. For these reasons, this research found that the 'Type 2' (non-adopters) plantations had a negative perception of public programmes based on their previous experience that the national and regional offices of the Department of Agriculture do not often coordinate. According to Rogers (2003), farmers tend to expose themselves to situations aligned with their existing belief. Thus, a negative perception about government programmes prevents them from to exposing themselves to the *PhilGAP* certification process. Since the implementation of the *PhilGAP* certification programme is managed by the agencies under the Department of Agriculture, they perceived that it is likely to be poorly coordinated hence leading to unnecessary bureaucracy and delays. However, a key informant revealed that the lack of coordination is being addressed during the transition period of the implementation of the *PhilGAP* certification programme from BAFS to BPI. Sarsud (2007) and Wongprownas et al. (2015) argued that a lack of coordination is a common problem in the public GAP programmes, especially when a government sets an over-ambitious objective of certifying a large number of producers.

A perceived lack of independence in the audit process

This research found that another barrier to the adoption of the *PhilGAP* certification programme is the perceived lack of independence in the government's audit process. A 'Type 2' (non-adopter) plantation believed that the result of the local inspections could be influenced by a person of greater authority in the government. For this reason, they preferred to use private GAP programmes to ensure the credibility of the audit results. A key informant refused to comment on this issue because of the sensitivity of the political situation. Wongprawnas et al. (2015) argued that a public GAP programme's audit process is open to political manipulation.

For 'Type 1' (adopter) plantations, the process barriers did not have enough bearing to discontinue the participation in the *PhilGAP* certification programme. They have no problems dealing with government inspectors and they made the necessary adjustments to address government bureaucracies and inequities. For example, 'Type 1' plantations submit their application for the renewal of the *PhilGAP* certificate three months before it expires to ensure there is adequate time to compensate delays in the government bureaucracies. In addition, they have wider networks, both in the industry and the government at the local and national levels, to verify any conflicting information about the results of the inspection, but they have not experienced this so far.

7.4.4 Reward or Incentive Barriers

The fourth type of barrier to the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) in 2011 is the lack of local demand and a premium price for *PhilGAP*-certified products. They argued that the government efforts are focused on the adoption of the certification programme and, to a lesser extent, on market promotion of *PhilGAP*-certified crops. For 'Type 3' (non-adopter) banana plantations, reward or incentive barriers were irrelevant because growers were not aware of the *PhilGAP* certification programme. For 'Type 2' (non-adopter) banana plantations, they believed that *PhilGAP*-certified products are not recognised by their customers in the export markets as compared to *GlobalGAP*. The lack of incentive or reward was identified at the persuasion stage of Rogers' (2003) adoption process and acted as a barrier to the adoption of the programme during the decision stage. For 'Type 1' (adopter) banana plantations, this research found that there was still no premium price for *PhilGAP*-certified products in the export markets, or an export market that specifically require these products five years after the initiation of the Banzon et al. (2013a) study. In contrast, crops produced using *MyGAP*, a public GAP programme, has higher prices compared to non-*MyGAP* products in Malaysia (Tey et al., 2015). However, 'Type 1' plantations continue to participate in the certification programme despite these barriers because they gained advantages in other aspects of the business such as workers' health and safety. In addition, this research found that the government provides greater price and promotion incentives to farmers who produce organic products as opposed to those who produce *PhilGAP*-certified products. Similar findings were reported in Thailand's *QGAP* certification scheme among pumelo growers (Amekawa,

2013), in which there was no premium price or floor price for *QGAP*-certified products as compared to the fair trade or organic products, and this was seen as a barrier to adoption.

7.4.5 Scale of Farm Operations

The fifth barrier to the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) were scale constraints. Banzon et al. (2013) identified one scale constraint due to the certification requirement of having a 50-metre buffer zone around water sources. They reported that this could be a problem for small farms with an average farm size of 1.73 hectares because it caused a large reduction in the production area. They identified a second scale constraint in relation to a lack of economies of scale for investment in the facilities required by the certification programme. Scale did not emerge as a barrier in this study because participating plantations were above the average size and the participating plantations (most of the 'Type 3' – 'Plantations G, H, I') that were smaller in size were not aware of the programme. However, a key informant revealed that there is no minimum farm size requirement to apply for the *PhilGAP* certification programme. As such, scale remains a barrier to the adoption of the PhilGAP certification programme.

7.4.6 Trade Issues in the Industry

The sixth barrier to the adoption of the *PhilGAP* certification programme is the trade issues in the banana industry as revealed by the key informants. This research found that there are splinter groups or non-government accredited growers, traders and exporters in the value chain. They buy bananas from non-accredited growers and sell these using the licences of accredited exporters through royalty arrangements. This provides a disincentive for accredited growers to adopt *PhilGAP* certification because such splinter groups do not usually check the quality of bananas for export. This situation undermines the BPI-PQS mandatory regulations that require the inspection of agricultural practices from harvesting to packaging for all Cavendish bananas for export. It can be argued that if the problem of public mandatory regulation is not addressed, there is no guarantee that a public voluntary certification scheme like the *PhilGAP* certification would be properly enforced.

Another trade issue found in this research that remains a problem in the industry is the pole-vaulting operations. This was also identified by Banzon et al. (2013a) in 2011. In this process, a contract growing arrangement occurs when a grower enters into a supply agreement with the institutional buyers at a predetermined price for the production and supply of agricultural products for a certain period of years (Digal, 2007). Growers are expected to have the facilities needed to produce the bananas, but the institutional buyers are expected to provide technical assistance to the growers to meet certain quality requirements. Because of price competition in the international markets, some banana growers do not honour their contractual obligation to their exporters or institutional buyers.

The pole-vaulting operations and presence of splinter groups also disrupts the traceability of bananas within the value chain. The traceability of agricultural produce is a key component of both public and private GAP programmes (Amekawa, 2009; Nicetic et al., 2010; Robert and Menon, 2007). In addition, pole-vaulting and the use of splinter groups are a disincentive to accredited exporters and institutional buyers investing in the growers' production facilities that are needed to meet the quality requirements of the *PhilGAP* certification programme.

A key informant revealed that the small banana growers such as those in 'Type 3' and institutional buyers such as those in 'Type 2' are affected by these industry-wide issues. Banana growers who do not rely on their institutional buyers or exporters to improve their facilities and practices on-farm such as 'Type 1' are unlikely to be affected because they operate independently.

7.4.7 Competition with *GlobalGAP*

Another barrier to the adoption of the *PhilGAP* certification programme is the existence of *GlobalGAP*, which is viewed as a competing technology and is considered as the gold standard for QMS in export markets. However, this barrier is irrelevant for 'Type 3' (non-adopter) banana plantations because they were not aware of the *PhilGAP* certification programme, more so with *GlobalGAP*.

For 'Type 2' (non-adopter) banana plantations, this study found that the perception of growers that adopted *GlobalGAP* was that it required greater effort to achieve *GlobalGAP* than the *PhilGAP* certification programme. Valk and Roest (2009), in a study of benchmarking government-led GAP with *GlobalGAP*, reported that the *GlobalGAP* certification scheme is more stringent than *MexicoGAP* and *MalaysiaGAP* – both are public GAP programmes. They also reported that where *GlobalGAP* had higher certification standards than the public GAP programmes, it commanded stronger market power, a point also highlighted in this study. As such, growers tend to participate in *GlobalGAP* rather than public GAP schemes because they see this as a requirement of retailers in the export markets through a business-to-business transaction (Burell, 2011; Vandemoortele & Deconinck, 2014). In addition, this research found that growers tend to adopt *GlobalGAP* because they perceived that the public GAP programme lacks independence and credibility. Some growers tend to limit their exposure to government processes which lack independence, reliability and credibility (Sarsud, 2007; Wongprawmas et al., 2015). In short, some companies participating in *GlobalGAP* see *PhilGAP* as having lesser value as a GAP scheme.

In contrast to the 'Type 2' plantations, the 'Type 1' (adopter) plantations did not view *PhilGAP* and *GlobalGAP* as competing technologies. They believed that *PhilGAP* and *GlobalGAP* certification schemes could be used together to enhance the QMS of their plantations. Thus, they continue to participate in the *PhilGAP* certification programme because the different drivers of adoption

outweighed these barriers. The following section discusses the drivers of adoption of the *PhilGAP* certification programme.

7.5 Drivers of Adoption of *PhilGAP* Certification Programme

There was no *PhilGAP*-certified Cavendish banana plantation in 2011. However, the study conducted by Banzon et al. (2013a) in 2011 reported that the drivers of the adoption of a generic GAP programme for Cavendish banana plantations included: 1) the requirements of the international market, and 2) the presence of a quality-focused corporate culture. In addition, this study also found two new drivers for the adoption of the *PhilGAP* certification programme in the Cavendish banana plantations. These drivers have also been reported for other QMS certification in other crops in the literature, namely: 1) *PhilGAP* serves as a repository that satisfies other types of government policies, and 2) the government subsidies that include provisions of free certification services, and chemical residue analysis. Figure 39 shows the drivers of the adoption of the *PhilGAP* certification programme in the Cavendish banana plantations. The following sections discuss how these drivers led to the adoption of the *PhilGAP* certification programme.

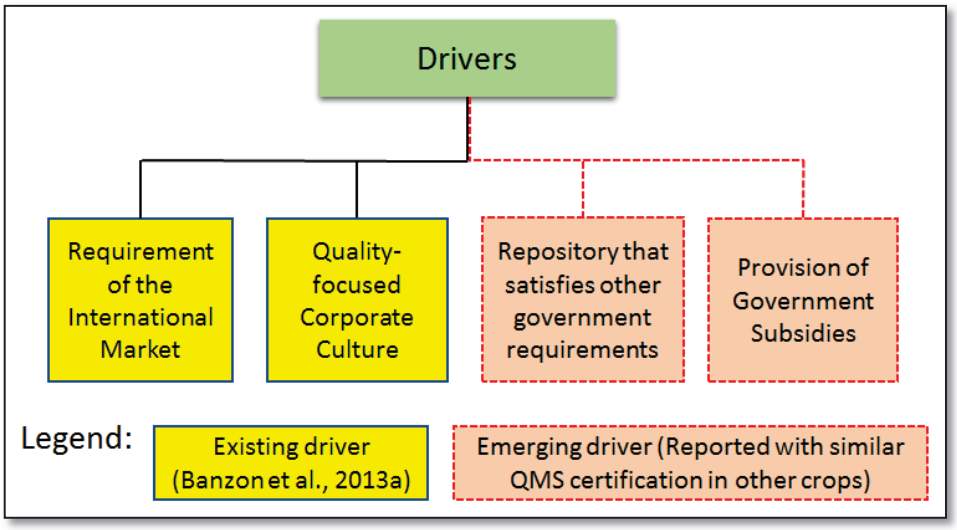


Figure 39. Drivers of the adoption of *PhilGAP* certification in the Cavendish banana plantations.

7.5.1 Requirement of the International Market

Banzon et al. (2013a) identified that a key driver for the adoption of *PhilGAP* is the requirements of international markets. This study found that this was an important driver, but not quite in the way reported by Banzon et al. (2013a). The plantation that adopted the *PhilGAP* certification programme saw it as a stepping stone to achieving *GlobalGAP* certification, the gold standard of QMS in international markets. As such, *PhilGAP* was a means to an end rather than the end itself. This driver was identified as a prior condition to Rogers' (2003) adoption process because 'Plantation A' felt the need to obtain a *GlobalGAP* certificate. 'Plantation A' recognised that the programme could help

improve the farm operations, and could raise their standards to bridge the gap between the current system and the desired goal for a *GlobalGAP* certificate. Although a *PhilGAP* certificate is not required in the international market, the *PhilGAP* certification exercise enabled the company to assess their practices through the government's audit process prior to participation in the *GlobalGAP* certification process. Valk and Roest (2009 p. 9) reported that many countries such as Malaysia and Mexico have benchmarked their government-led GAP standards on *GlobalGAP* as "a marketing instrument to expand export market". The benchmarking was used to gain more credibility in markets targeted for expansion. However, the study did not draw conclusions about whether the benchmarking procedure has increased participation in the public GAP programmes (Valk & Roest, 2009). In this research, 'Plantation A' viewed participation in the *PhilGAP* certification programme as a springboard to facilitate participation in *GlobalGAP* certification. The guidelines set by the *PhilGAP* certification programme provided a minimum standard of production operation to meet the quality requirements of the market. Nabeshima et al., (2015) argued that participating in a local public GAP scheme can be used if a company aims to obtain *GlobalGAP* certification later on.

7.5.2 The Presence of a Quality-focused Corporate Culture

The second driver for the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) in 2011 is the presence of a corporate culture that is forward-looking and open to change as regards to improving quality. 'Plantation A' believes that running two certification programmes, *PhilGAP* and *GlobalGAP*, enhances their reputation as a company focused on quality in the eyes of their customers and the government. This driver was identified at Rogers' (2003) decision stage of the adoption process. 'Plantation A' thought that the additional inspection from the government ensured that they are producing high quality bananas as reflected in the company's vision for *"Total Quality"* bananas. This provides further evidence of the efficacy of their quality management. The continued presence of the *PhilGAP* certification programme does not antagonise the participation in *GlobalGAP* certification programme as opposed to what some often view about the antagonistic effect of public and private GAP programmes to one another (Raymond & Bonnaud, 2014). Gunningham and Rees (1997) argued that there is no dichotomy between private and public standards as a matter of regulation, but it is rather a continuum of regulations in which private and government regulations are at the opposite ends. It can be argued that the government regulations are the bare minimum, with private regulations going beyond that. Thus, both private and public standards can co-exist and be practised by a single entity at the same time.

In addition, 'Plantation A' is a role model within the industry and has taken a leadership role. One of the reasons it operates *PhilGAP*, as well as *GlobalGAP*, is because this could influence other growers to adopt the *PhilGAP* certification programme and consequently improve product quality, food safety, environmental sustainability and workers' health and welfare across the whole industry. Banzon et al. (2013a) recommended that farmer-innovators showcase the *PhilGAP* certification activities to hasten

its adoption among banana plantations. This study found that 'Plantation A' was doing this as the leading plantation in the industry. As such, it contributes to the industry's general reputation as a producer of high quality bananas.

On the other hand, 'Plantation B' participates in the *PhilGAP* certification programme, but does not have *GlobaGAP* certification yet. In the absence of more stringent and expensive private certification standards, participating in a public GAP certification can create an impression of how responsible farmers are (Tey et al., 2015).

7.5.3 Serves as a Repository that Satisfies Other Government Requirements

The third driver of the adoption of the *PhilGAP* certification programme is that the regulatory requirements of the programme serve as a repository that satisfies other government requirements. This research found that the practices stipulated in *PhilGAP* are aligned with the policies of other government agencies. This driver was identified at Rogers' (2003) confirmation stage, which allowed the continued participation in the programme. For example, the guidelines for *PhilGAP* include proper storage, and the application and disposal of fertiliser and pesticides, which are also monitored by the FPA. Thus, compliance in the certification programme also means compliance with the FPA requirements. In addition, the DENR inspects the environmental conditions of the plantation, which are also present in the Environmental Sustainability module of *PhilGAP*. Thus, compliance with *PhilGAP* requirements can also lead to compliance with other government regulations. Raymond and Bonnaud (2014) stated that participating in *GlobalGAP* under a European context brings together separate existing elements of law through a voluntary certification scheme. Since *GlobalGAP* is the key reference for the benchmarking and harmonisation of government-led GAP standards, it follows that *PhilGAP* and other government-led standards also collate the existing laws in their respective countries and incorporate them into their national GAP guidelines.

7.5.4 Provision of Government Subsidies

The final driver for the adoption of the *PhilGAP* certification programme identified in this study is the subsidy the government has placed on (1) the *PhilGAP* certification process, and (2) the cost of testing samples for microbial and chemical residues. This driver was identified during the knowledge stage of Rogers' (2003) adoption process, and then realised during the implementation stage. The free certification service and analyses of microbial contaminants and chemical residues had motivated 'Plantation A' to adopt the programme across all its districts because it did not entail the additional cost for management. The subsidies had existed as early as 2008, but because the programme was not promoted well at that time, Banzon et al. (2013a) did not identify the subsidy as a driver of adoption. Similar results were found in Thailand where farmers were encouraged to participate in the *QGAP* certification programme through its free certification services (Sarsud, 2007).

7.6 Summary

This chapter compares the findings of the research against the literature. The study reveals that the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) in 2011 still exist and that new barriers and drivers have emerged five years later. The barriers to the adoption of *PhilGAP* certification programme for the Cavendish banana plantations were classified under seven main types. These included: (1) knowledge, (2) cost, (3) processes, (4) rewards or incentives, (5) scale of farm operations, (6) trade issues in the banana industry, and (7) competition with the *GlobalGAP* certification programme, the gold standard QMS by the industry. Barriers identified under the first six categories were also identified by Banzon et al. (2013a) in 2011. Sub-types of these barriers have also emerged from this research, namely: (1) the processes involved in the audit, particularly the disagreements on the concept of quality, the perceived lack of coordination and the perceived lack of independence in the audit process; and (2) the trade issues in the industry, specifically the presence of splinter groups or non-accredited groups of banana growers, packing facilities, traders and exporters. Using the lens of Rogers' (2003) adoption process, these barriers occurred at different stages among the non-adopters (Type 2 and Type 3) but were overcome by the adopters (Type 1) of the programme.

This research also found four key drivers of the adoption of the *PhilGAP* certification programme. These drivers include: (1) the requirements of the international market; (2) the presence of a quality-focused corporate culture; (3) serves as a repository that satisfies other types of government policies; and (4) the government subsidies that include provisions of free certification services, and chemical residue analysis. The first two drivers were also identified by Banzon et al. (2013a) in 2011 while the last two drivers have emerged from this study. Likewise, these drivers occurred at different stages of Rogers' (2003) adoption process.

This chapter discussed the findings of the research and their position in relation to the literature. The next chapter provides the conclusions for the research.

Chapter 8: CONCLUSIONS

8.1 Introduction

The research aimed to investigate the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme for Cavendish bananas in the Philippines. A qualitative case study approach was used to meet the following objectives: (1) Describe the current and emerging barriers to, and drivers of, the adoption of the *PhilGAP* certification programme by Cavendish banana plantations and compare these to those identified by Banzon et al. (2013a) in 2011; (2) Describe the effect of these barriers and drivers on the adoption of the *PhilGAP* certification programme for Cavendish banana plantations; and lastly (3) Explain the reasons behind the adoption and continued participation of some Cavendish banana plantations in the *PhilGAP* certification programme.

The study used Rogers' (2003) adoption process as a useful tool for the structural analysis of the adoption or rejection of the *PhilGAP* certification programme. Each stage in the adoption process has a rejection point and, as such, this lens provided insights into the barriers to, and drivers of, the adoption of the certification programme. Each stage can either lead onto the next stage of the adoption process or it can stop if the grower rejects the technology at a rejection point. This study contributes to the body of knowledge by providing an example of how a public GAP certification programme is adopted or not adopted in plantation agriculture where barriers and drivers were identified using Rogers' (2003) adoption process. It also provides an example of where public and private GAP certification programmes can co-exist and be implemented simultaneously by a single entity.

In this chapter, Section 8.2 provides the research conclusions from the study and Section 8.3 outlines the recommendations and policy implications that flow from these findings. The evaluation of research methodology is discussed in Section 8.4 and then Section 8.5 provides suggestions for future research.

8.2 Research Conclusions

The barriers to, and drivers of, the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) in 2011 for the Cavendish banana plantations still exist and new barriers and drivers have also emerged five years after the initial study. The barriers to the adoption of the *PhilGAP* certification programme by Cavendish banana plantations identified by Banzon et al. (2013a) that still exist include constraints in relation to: (1) knowledge, (2) cost, (3) processes, (4) rewards or incentives, (5) scale of farm operations, and (6) trade issues within the banana industry, particularly the practice of pole-vaulting. The emerging barriers identified by this research include sub-types of these barriers, namely: (1) the processes involved in the audit, particularly the disagreements on the concept of quality, the lack of coordination and the lack of independence in the

audit process; and (2) the trade issues in the industry, specifically the presence of splinter groups or non-accredited groups of banana growers, packing facilities, traders and exporters. A new category of barrier has also emerged which is the presence of the *GlobalGAP* certification programme, a competing technology and the gold standard QMS.

On the other hand, the drivers of the adoption of the *PhilGAP* certification programme identified by Banzon et al. (2013a) that still exist include: (1) the requirements of the international market; and (2) the presence of a quality-focused corporate culture. Emerging drivers identified by the study included: (1) serves as a repository that satisfies other types of government policies; and (2) the government subsidy that includes the provision of both a free certification service, and a free chemical residue analysis.

The identified barriers have limited the non-adopters in various ways. The 'Type 3' (non-adopter) plantations either had little or no awareness of the *PhilGAP* certification programme, or if they were aware of it they had misconceptions about it. For growers who were unaware of the *PhilGAP* certification programme, the other barriers were not relevant to their adoption decision. In contrast, 'Type 3' growers who were aware of it, but held misconceptions about the programme, perceived that cost constraints (compliance and certification costs) were the main barriers. But these perceptions were based on faulty knowledge. On the other hand, the 'Type 2' (non-adopters) plantations were not constrained by knowledge and perceived cost barriers. These plantations are members of a large industry association and, as such, they have access to workshops and seminars that provided information about the *PhilGAP* certification programme. These extension activities also provided the growers with both the explicit knowledge about the principles behind the programme, and the tacit knowledge about how to manage the process in practice. In addition, cost constraints were not considered a barrier to the adoption of the *PhilGAP* certification programme by 'Type 2' plantations because firstly, the certification and chemical residue costs of the *PhilGAP* certification programme are met by the government. Secondly, because these growers had already adopted *GlobalGAP*, the gold standard QMS, they would incur no additional compliance costs because these had already been met in order to obtain *GlobalGAP* certification. Other barriers, process and reward or incentive constraints, were much more important to 'Type 2' plantations in limiting their participation in the *PhilGAP* certification programme. These plantations had a negative perception of the government processes around the *PhilGAP* certification scheme. They believe that it was poorly coordinated and lacks independence. They also perceived that there is no premium price for *PhilGAP*-certified bananas because the programme is not recognised by international markets. Failure by the government to control "pole-vaulting" and splinter groups further diminished the value of the programme in the eyes of the 'Type 2' growers and this acted as a further barrier to its adoption. It provided a disincentive for 'Type 2' plantations to provide support to contract growers in terms of infrastructure and training relevant to the *PhilGAP* certification programme because these growers

might decide to supply their bananas to other exporters. For 'Type 2' plantations, the most important barrier to the adoption of *PhilGAP* certification programme is their perception that it is inferior to the QMS scheme they are currently running which is *GlobalGAP*. As such, they see no advantage in adopting the *PhilGAP* certification programme.

Although only two Cavendish banana plantations were identified as having adopted the *PhilGAP* certification programme, the study did identify the drivers behind their decision to adopt. At the start of the Banzon et al. (2013a) study in 2011, there were no *PhilGAP*-certified Cavendish banana plantations. However, their study identified that the requirements of the international market and the presence of a quality-focused corporate culture could drive the adoption of the certification programme. This research revealed that *PhilGAP* was used as a springboard to participate in the *GlobalGAP* certification programme. Nonetheless, the company maintained both the *PhilGAP* and *GlobalGAP* certificates in line with the corporate culture of being forward-looking and open to change as regards to improving quality. In addition, two further emerging drivers were identified that have also led to their continued participation in the programme. These were that 1) *PhilGAP* served as a repository that satisfies other government regulatory requirements and 2) the provision of a government subsidy that provides free certification services, and chemical residue analysis.

The 'Type 1' (adopter) continues to participate in the *PhilGAP* certification programme because they have been able to overcome the barriers that have constrained its adoption by other growers. The knowledge barrier was overcome by working closely with the government and involvement in association seminars and workshops. The cost barriers were overcome because firstly, the certification and chemical residue costs of the *PhilGAP* certification programme are met by the government. Secondly, the company did not view cost as a barrier, rather it was something they needed to invest in to meet quality standards. Thus, they funded the compliance costs to ensure that they met export requirements and maintained their corporate culture around quality. The process constraints were overcome by proactive engagements in government activities such as training, and adjusting the application of the *PhilGAP* certificate renewal to an earlier date. Although the economic rewards or incentives in terms of premium prices were not paid for *PhilGAP*-certified bananas, the adopters did highlight other advantages such as improvement in the workers' performance and safety awareness. The 'Type 1' plantations were also not affected by the 'pole-vaulting' operation which is considered as an industry-wide problem because they do not have contract growers. Lastly, the 'Type 1' plantations did not view *PhilGAP* and *GlobalGAP* as competing technologies. They believed that the *PhilGAP* and *GlobalGAP* certification schemes could be used together to enhance the quality management of their plantations.

In conclusion, this research has found that the adoption rate of the *PhilGAP* certification programme for the Cavendish banana plantations remains low because many of the barriers to adoption have not

been properly addressed by the government and the benefits from adoption have not been properly communicated to the intended adopters.

8.3 Recommendations and Policy Implications of the Research Findings

Based on the findings from the research, this section suggests possible recommendations for improving the implementation of the *PhilGAP* certification programme. The study revealed that knowledge of the programme remains a key barrier to adoption particularly for growers who are not members of industry organisations. Thus, the BPI, as the new implementing government agency, needs to intensify the promotion of the programme to the intended adopters. 'Type 3' growers who were not members of a grower association were not aware of the *PhilGAP* certification programme or had misconceptions about it. As such, the promotion should be extensive to reach out to these types of plantations.

This study also found that the general GAP training provided by the government for the mandatory accreditation of growers, packing facilities, traders and exporters made no mention of the *PhilGAP* certification programme. As such, the general GAP training programmes required for mandatory accreditation could be used to disseminate relevant information about *PhilGAP* certification. There are benefits in participating in the *PhilGAP* certification, but because of a lack of information, growers cannot make an informed decision about whether to participate in it.

The study found that some components of the certification process were a barrier to adoption. One is that the concept of quality is contested between the growers and the regulators. Another is that growers' perceptions of the *PhilGAP* certification programme also acted as a barrier to adoption. Based on previous experience with other government programmes, growers perceived that there was lack of coordination between government agencies that implemented *PhilGAP*. They also perceived that the certification process was not independent and open to political manipulation. To address these problems, a regular dialogue with the banana growers is recommended because growers needed to be better informed and the process needs to be more transparent. By engaging both parties in discussions, conflicting views are minimised.

Lastly, an important finding from the study was that 'Type 1' plantations used *PhilGAP* as a stepping stone for *GlobalGAP* certification. There are a large number of growers who have yet to achieve *GlobalGAP* certification. As such, the government could promote *PhilGAP* as a means of achieving *GlobalGAP* certification and use 'Plantation A' to promote this approach within the industry.

8.4 Evaluation of the Research Methodology

This section evaluates what worked well in the research methodology and what could be improved in order to answer the research questions. The case study approach was found appropriate to investigate the barriers and drivers of adoption of the *PhilGAP* certification programme – a messy and complicated problem in the Philippines' agriculture sector.

The choice of a single-case study was suitable for capturing an in-depth understanding of the banana growers' and key informants' accounts of the problem situation. Data was collected for a period of two months through interviews with 10 banana growers and nine key informants. In addition to the interviews, documents were collected from the key informants and a field observation from one of the banana plantations. The organisation and analysis of these data took the researcher four months to complete the process. Because of the limited time allotted for a Master's thesis project, the researcher would have not been able to conduct a multiple-case study to this depth among the different types of adopters. In contrast, the initial study conducted by Banzon et al. (2013a) in 2011 took nine months to gather data by a group of three researchers through interviews and focused group discussions. Nonetheless, the current methodology was able to identify the barriers and drivers of adoption similar to the barriers and drivers identified by Banzon et al. (2013a) in 2011. In addition, Rogers (2003) adoption process was a useful framework in identifying the barriers and drivers of adoption of the *PhilGAP* certification programme.

Some problems occurred during the data collection when the actual activity deviated from the planned activity. The plan was to have a one-to-one interview with the key informants first, and then followed by the banana growers in order to obtain a wider perspective of the problem situation. However, it was difficult to set a suitable schedule with the key informants who were mostly based in Manila, and banana growers who were all based in Mindanao. In addition, some participants tended to invite other colleagues to join the interview to enhance the accuracy of data. The commercial sensitivity of the topic was a problem with some banana growers evading commercially sensitive questions, but a few others were responsive to the same questions. Likewise, a key informant requested the researcher to delete sensitive political and security information after the interview had been transcribed. In effect, the case description and results were also limited to the data approved by the participants according to their perceived sensitivity of the information.

The field observation was not a planned activity because of the initial sense that banana plantations would not allow this to occur because of commercial sensitivity. But in reality, one banana grower allowed the researcher to observe their field operations and the insights obtained from this activity cannot be ignored. As such, their agricultural operations could not be compared and contrasted with other Cavendish banana plantations, limiting the usefulness of this data.

8.5 Suggestions for Future Research

This research identified the barriers to, and drivers of, the adoption of the *PhilGAP* certification programme for the Cavendish banana plantations. It would also be useful to investigate the barriers to, and drivers of, the adoption of alternative export crops such as pineapple and coconut, to identify if these are sector-specific or occur across all *PhilGAP* products.

This research also found that the *PhilGAP* certification programme is considered to be a complex technology that requires compliance on different components and involves the discourses and actions of different actors in the value chain. *PhilGAP* is created and recreated by different groups of actors depending on regulatory and marketing trends. This research focused on the adoption process of the current programme under BAFS. It would also be interesting to find out the reasons for adoption or non-adoption of the PhilGAP certification programme after the transition period to BPI using the agricultural innovation system as a lens for structural analysis.

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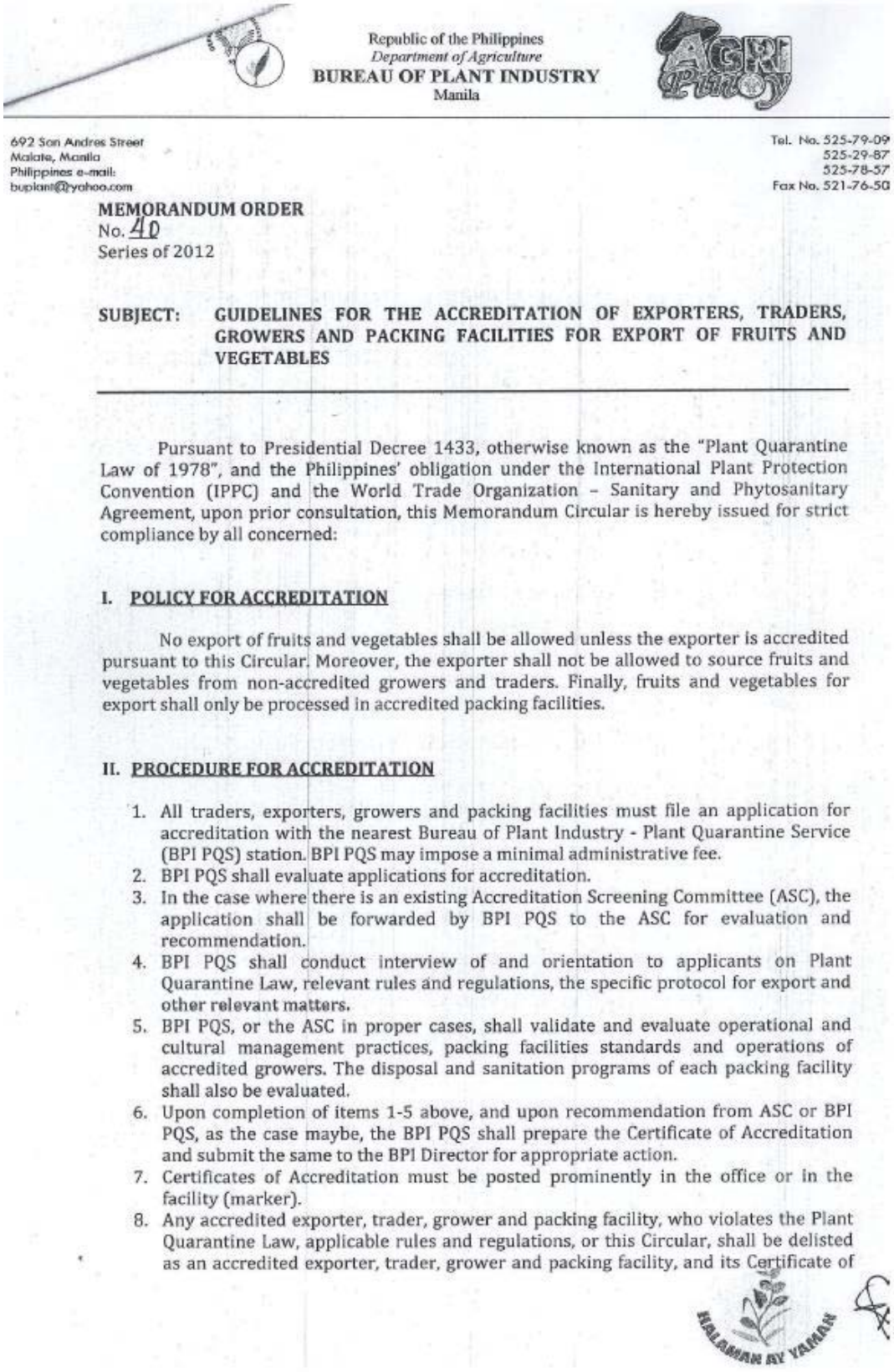
APPENDICES

Appendix 1. Memorandum Order 40. Guidelines for the accreditation of exporters, traders, growers and packing facilities for export of fruits and vegetables



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MEMORANDUM ORDER
No. 40
Series of 2012

SUBJECT: GUIDELINES FOR THE ACCREDITATION OF EXPORTERS, TRADERS, GROWERS AND PACKING FACILITIES FOR EXPORT OF FRUITS AND VEGETABLES

Pursuant to Presidential Decree 1433, otherwise known as the "Plant Quarantine Law of 1978", and the Philippines' obligation under the International Plant Protection Convention (IPPC) and the World Trade Organization – Sanitary and Phytosanitary Agreement, upon prior consultation, this Memorandum Circular is hereby issued for strict compliance by all concerned:

I. POLICY FOR ACCREDITATION

No export of fruits and vegetables shall be allowed unless the exporter is accredited pursuant to this Circular. Moreover, the exporter shall not be allowed to source fruits and vegetables from non-accredited growers and traders. Finally, fruits and vegetables for export shall only be processed in accredited packing facilities.

II. PROCEDURE FOR ACCREDITATION

1. All traders, exporters, growers and packing facilities must file an application for accreditation with the nearest Bureau of Plant Industry - Plant Quarantine Service (BPI PQS) station. BPI PQS may impose a minimal administrative fee.
2. BPI PQS shall evaluate applications for accreditation.
3. In the case where there is an existing Accreditation Screening Committee (ASC), the application shall be forwarded by BPI PQS to the ASC for evaluation and recommendation.
4. BPI PQS shall conduct interview of and orientation to applicants on Plant Quarantine Law, relevant rules and regulations, the specific protocol for export and other relevant matters.
5. BPI PQS, or the ASC in proper cases, shall validate and evaluate operational and cultural management practices, packing facilities standards and operations of accredited growers. The disposal and sanitation programs of each packing facility shall also be evaluated.
6. Upon completion of items 1-5 above, and upon recommendation from ASC or BPI PQS, as the case maybe, the BPI PQS shall prepare the Certificate of Accreditation and submit the same to the BPI Director for appropriate action.
7. Certificates of Accreditation must be posted prominently in the office or in the facility (marker).
8. Any accredited exporter, trader, grower and packing facility, who violates the Plant Quarantine Law, applicable rules and regulations, or this Circular, shall be delisted as an accredited exporter, trader, grower and packing facility, and its Certificate of

Accreditation shall be revoked. Re-accreditation shall only be possible upon compliance of all corrective measures based on thorough BPI-PQS investigation.

9. Exporters, traders, growers and packing facilities shall allow the inspection, regular or otherwise, of their facilities by BPI PQS or any personnel of the Department of Agriculture as may be authorized by the Secretary.
10. A person or a juridical entity who is at the same time an exporter, trader, grower and own a packing facility, or any combination of the above, shall comply with all the stated requirements for accreditation of an exporter, trader, grower and/or packing facility, as the case may be.
11. Accreditation shall be renewed on a yearly basis.

III. REQUIREMENTS FOR ACCREDITATION

A. ACCREDITATION OF EXPORTER

Applicants for accreditation as exporter shall submit the following documentary requirements:

1) Current Mayor's Permit;
2) Securities and Exchange Commission (SEC), Cooperative Development Authority (CDA) or Department of Trade and Industry (DTI) Certificate of Registration;
3) Duly audited Financial Statement for the preceding year, if applicable;
4) Tax Clearance
5) List of director/s, partners and officers, if corporate, partnership or cooperative, or 2x2 photo of the owner/s if a single proprietorship;
6) List of quality assurance personnel with corresponding qualifications;
7) List of accredited growers, production sites, location maps, area coverage (has.)
8) Their Farm Cultural Practices, Pest Management and Waste Disposal systems;
9) List of accredited packing facilities
10) Packing facility operations, pest management and waste disposal practices;
11) Quality Standards Accreditation/s;
12) BPI PQS Pest Index Survey and Validation Reports;
13) PS Mark and/or ISO and/or SQF and/or DTI-ISO aligned accreditation required by the importing country and the appropriate Philippine Government agency, whenever necessary;
14) List of accredited traders;
15) Valid supply contracts between exporter and accredited growers indicating area coverage (has.), volume and period of contract, or accredited trader;
16) A sworn declaration on the volume and value of exportation per destination for the preceding year;
17) BPI PQS Inspection Report, and,
18) Brand name/s (optional).

B. ACCREDITATION OF TRADER

A trader is a person or a juridical entity who for his own account or on behalf of an exporter purchases fruits and vegetables for supply to an exporter. Applicants for accreditation as trader shall submit the following documentary requirements:

1) Current Mayor's Permit;

2) Securities and Exchange Commission (SEC), Cooperative Development Authority (CDA) or Department of Trade and Industry (DTI) Certificate of Registration;
3) Duly audited Financial Statement for the preceding year, if applicable;
4) Tax clearance;
5) List of director/s, partners and officers, if corporate, partnership or cooperative, or 2x2 photo of the owner/s if a single proprietorship;
6) List of accredited growers, farms, location maps, area coverage (has.),
7) Valid supply contracts between trader and accredited growers indicating area coverage (has.), volume and period of contract;
8) List of accredited exporters
9) List of accredited packing facilities;
10) Valid agreement between the exporter and the trader;
11) Brand name/s (optional);
12) BPI PQS Inspection Report, and,
13) Notarized certification from trader indicating that:
    i. the fruit and vegetables are sourced from growers with whom it has existing supply contracts, and that said growers do not have contractual obligations with any other exporter or trader
    ii. the fruit and vegetables to be exported will meet all the standards established by PNS or by the importing country
    iii. the fruit and vegetables for export is not illegally acquired.

C. *ACCREDITATION OF GROWERS*

Applicants for accreditation as growers shall submit the following documents:

1) Community Tax Certificate;
2) Information on their production area, *i.e.,* proof of ownership, valid claim of possession or any agreement which allows the applicant to use the property, location plan, land area of production site, estimated volume of production;
3) Certificate of Attendance of owner, farm manager or a quality assurance in a training on Good Agricultural Practices (GAP); and,
4) BPI PQS Inspection Report.

D. *ACCREDITATION OF PACKING FACILITIES*

Applicants for accreditation as a packing facility shall submit the following documents:

1) Current Mayor's Permit
2) Floor Plan & Location Map
3) 2x2 photo of the owner
4) Packing Facility Process Flow
5) Disposal System for Rejected Fruits
6) Disinfestation Program for the Packing Facility
7) Written standard operating procedure, including pest management and other safeguards;
8) A statement that the packing facility is insect-proof and equipped with a minimum of two (2) wash tanks, with sufficient clean water supply and sufficient lighting, dryer/ blower, proper clean storage area, high pressurized water spray and conveyor lines;
9) List of Technical and Non-Technical Personnel;

10) Certificate of attendance of the owner, facility manager or a quality assurance in a training on Good Manufacturing Practices; and,
11) List of Exporters using the facility and the export destination
12) BPI PQS Inspection Report

IV. TRANSITORY PROVISION

All exporters, traders, growers and packing facilities with existing accreditation shall comply with the applicable provisions of this Circular.

V. EFFECTIVITY

This Memorandum Circular takes effect immediately and repeals and/or amends all other issuances inconsistent hereof.

This Memorandum Circular takes effect immediately.

07 June 2012, Quezon City

CLARITO M. BARRON, PhD, CESO IV
Director
Bureau of Plant Industry

Appendix 2. Memorandum Order 41. Revised protocol for the export of fresh banana

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MEMORANDUM ORDER
No. 41
Series of 2012

SUBJECT: REVISED PROTOCOL FOR THE EXPORT OF FRESH BANANA

Pursuant to Presidential Decree 1433 otherwise known as the "Plant Quarantine Law of 1978" and the Philippines' obligations under the International Plant Protection Convention (IPPC) and the World Trade Organization – Sanitary and Phytosanitary Agreement, and, upon prior consultation, this Revised Protocol is hereby issued for strict compliance by all concerned:

I. COVERAGE

This Revised Protocol shall apply to the exportation of hard green banana fruit of *Musa sp.*. No exportation shall be allowed in violation of this Protocol.

II. RESPONSIBILITIES

1. Responsibilities of the Bureau of Plant Industry – Plant Quarantine Service (BPI PQS)

   a. Supervise and implement this Protocol;
   b. Accredit growers, packing facilities, traders and exporters;
   c. Assign a unique and permanent code for each grower per production site, packing facility per facility, trader and exporter;
   d. Inform the National Plant Protection Organization (NPPO) of the importing country of the codes assigned to each grower, packing facility, trader and exporter;
   e. Enforce and, whenever necessary, revise, the pest management program guidelines herein provided;
   f. Conduct inspection, monitoring and audit of production areas of registered growers, packing facilities, trader and exporters, starting at the time the fruit is harvested, processed, packed and loaded for export, to verify compliance with this Protocol;
   g. Review and maintain all forms and documents related to export activities in places of production, packing facilities, trading and shipping documents;
   h. Conduct, in partnership with the Agricultural Training Institute and/or industry associations and other concerned agencies, trainings on Good Agricultural Practices, Good Manufacturing Practices and other related trainings;
   i. Issue Phytosanitary Certificate for each shipment.

2. Responsibilities of Banana Exporter

   a. Apply for accreditation as exporter with BPI-PQS;
   b. Submit list of accredited growers, their production sites and the contract;
   c. Submit list of accredited traders and the accredited grower(s) from which the trader sourced the bananas, production sites and the contract;
   d. Submit list of accredited packing facility operator and location of packing facility;
   e. Submit Production Manual;
   f. Ensure compliance to Good Manufacturing Practices (GMP) by the packing facility;
   g. Ensure compliance to Good Agricultural Practices (GAP) by the growers;
   h. Maintain all records in relation to banana export;
   i. Post its Accreditation Certificate prominently in the office (marker).
   j. Allow the inspection, regular or otherwise, of the exporter's facility by BPI PQS or any personnel of the Department of Agriculture as may be authorized by the Secretary;

3. Responsibilities of Banana Trader

   a. Apply for accreditation as trader with BPI-PQS;
   b. Submit list of accredited growers, their production sites and the contract;
   c. Submit list of accredited packing facility operator and location of packing facility;
   d. Submission of Production Manual;
   e. Ensure compliance to Good Manufacturing Practices (GMP) by the packing facility;
   f. Ensure compliance to Good Agricultural Practices (GAP) by the growers;
   g. Maintain all records in relation to banana export;
   h. Post its Accreditation Certificate prominently in the office (marker).
   i. Allow the inspection, regular or otherwise, of the trading facility by BPI PQS or any personnel of the Department of Agriculture as may be authorized by the Secretary;

4. Responsibilities of Banana Growers

   a. Apply for accreditation as grower per production site with BPI-PQS;
   b. Comply with the best agricultural practices based on the Good Agricultural Practices (GAP);
   c. Monitor and ensure pest level is under control;
   d. Post its Accreditation Certificate prominently at the entrance/front of the production area/farm (marker);
   e. Allow the inspection, regular or otherwise, of the production site by BPI PQS or any personnel of the Department of Agriculture as may be authorized by the Secretary.

5. Responsibilities of Packing Facilities

   a. Apply for accreditation as packing facility per facility with the BPI – PQS;
   b. Submit written standard operating procedure, including pest management and other safeguards;
   c. Ensure that the packing facility is insect-proof and its operations for export of bananas must be monitored by BPI PQS;
   d. Provide a minimum of two (2) wash tanks, with sufficient clean water supply and electricity, dryer/ blower, proper clean storage area, high pressurized water spray and conveyor lines;
   e. Have proper markings/labels on cartons for traceability, *i.e.*, exporter's accreditation code, grower's accreditation code, facility accreditation code, date of packing, destination, and any additional information as may be required by the importing country;
   f. Segregate fruits by export destination;
   g. Post its Accreditation Certificate prominently at the entrance/front of the facility (marker); and,
   h. Allow the inspection, regular or otherwise, of the packing facility by BPI PQS or any personnel of the Department of Agriculture as may be authorized by the Secretary.

III. TRACEABILITY

Harvested bananas must be placed in field cartons and containers that are properly marked to show the accreditation code of the exporter, packing facility and grower, date of packing, destination, and any additional information as may be required by the importing country. The place of production where the bananas were grown must remain identifiable when the fruit is transported from the place of production to the packing facilities and throughout the export process.

IV. PEST MANAGEMENT PROGRAM

Pre-harvest and Post-harvest Application

   a. Pseudostem sanitation to eliminate refuse and breeding sites of insect pests.
   b. Fruit obstruction removal (FOR) to prevent fruit damage as well as eliminate bridges that may be utilized by the pest to infest the fruit.
   c. Application of insecticide to prevent pest infestation for fruit care protection.
   d. Chlorpyrifos-impregnated polyethylene (PE) bags are used to cover the fruit bunches after bunch spray to prevent infestation of insects. When needed additional Chlorpyrifos-impregnated (PE) material (in form of "strip" or "square") is installed on the fruits as additional control against insect pest.
   e. Harvestable bunches are inspected for the presence of insect pests. Bunches with mealy bugs, scale and other insects are rejected/ discarded during harvest.
   f. Upon arrival of fruit at the packing plant, fruit bunches are sprayed with high-pressure water to eliminate any possible insect infestation. While bunches are waiting to be de-handed, the "fruit inspector" in

the packing plant will check for insect damage, particularly mealy bug infestation, on individual bunches.

g. During de-handing, individual hands are thoroughly inspected for possible mealy bug, scale insect infestation and any other evidence of insect damage.
h. After de-handing, individual hands are thoroughly cleaned (by brushing/foaming) by the fruit selector and further cleaned with high-pressure water to eliminate possible infestation of mealy bugs.
i. The individual hands are kept dried (using dryer/blower) and again inspected to confirm that fruits are free from mealy bugs and other insect during weighing and immediately before packing inside the box.
j. Unused pallets and those that are clean, dry and free from trash, soil, weed seeds and non-weeds contaminants are utilized by the industry.
k. Packed fruits are stored in a clean, insect-proof storage/container van or at cold storage. Wharf areas are maintained, kept clean and are situated away from population areas and farms.
l. Vessels and container vans are cleaned with the recommended disinfectant before loading.

V. BANANAS FOR HARVEST AND EXPORT

The bananas must be harvested at a hard green state. No banana that is at or past color break (turning yellow) may be harvested and exported. Damaged banana must not be included for export.

VI. SAFEGUARDING

Bananas must be safeguarded from exposure to pest from harvest throughout the entire post-harvest process up to export. Transport of these packed fruits from the packing facilities to the wharf shall be properly secured.

VII. POST-HARVEST PROCESSING

After harvest, all damaged or diseased or rejected fruits must be properly disposed.

All quality bananas shall be washed at the packing facility with a high-pressure water spray, de-handed and washed with chlorinated water. Bananas must be packed into new, clean boxes, crates or other packing materials.

VIII. FINAL BPI PQS INSPECTION

Bananas must be inspected in the Philippines under the direction and supervision of BPI PQS inspectors before exportation. A sample equivalent to 5% of the total number of boxes from each consignment shall be randomly selected by BPI PQS for inspection for quarantine pests. Notwithstanding that even a single pest is found, the Plant Quarantine Officer on duty shall automatically deny issuance of Phytosanitary Certificate (zero tolerance).

IX. ISSUANCE OF PHYTOSANITARY CERTIFICATE

Each consignment of fruits must be accompanied and covered by a phytosanitary certificate issued by BPI PQS.

X. SANCTIONS FOR NON-COMPLIANCE

Upon notice by the importing country of any non-compliance and/or violation by the exporter of the conditions of import, the exporter shall be deemed suspended from exporting to the same importing country until the corrective measures imposed by the importing country shall have been implemented to the satisfaction of BPI for purposes of requesting for the lifting of the said suspension.

As for any audit failure on the part of the exporters, traders, growers and/or packing facilities, the following sanctions shall be imposed:

First offense – warning with the obligation to undertake corrective measures within the period prescribed by BPI PQS. Failure to undertake corrective measures within the prescribed period shall merit suspension of accreditation.

Second offense – suspension of accreditation until the corrective measures shall have been implemented within the prescribed period by BPI PQS. Failure to undertake corrective measures within the prescribed period shall merit revocation of accreditation.

Third offense – revocation of accreditation with BPI-PQS and blacklisting

This Memorandum Order takes effect immediately and repeals and/or amends all other issuances inconsistent hereof.

07 June 2012, Quezon City

CLARITO M. BARRON, PhD, CESO IV
Director
Bureau of Plant Industry

Appendix 3. Interview Topic Guide

Interview Topic Guide for Type 1: Adopter of the *PhilGAP* certification programme

Background Questions

1. What is your official role in the company/banana plantation?
2. How long have you been working for the company / banana plantation?
3. What is the land area of the banana plantation (highland / lowland)?
4. What is the average planting density per hectare?
5. How long has it been operating?
6. Which country/countries do you export the bananas?

Philippine Good Agricultural Practices (*PhilGAP*)

7. What are your perceptions about the Good Agricultural Practices (GAP)?
8. How long have you been practising *PhilGAP*?
9. What other quality assurance certification program does your company comply and how is it different with *PhilGAP* based on your experience?
10. What are the reasons for adopting PhilGAP? Other quality assurance certification program?
11. What are the challenges experienced by the company in adopting PhilGAP?
12. What are the processes undertaken by the company before, during, and after *PhilGAP* certification application? (Knowledge, Persuasion, Decision, Implementation, Confirmation)
13. What are the differences that you observed before and after complying with *PhilGAP* and/or other quality assurance programs?
14. Do you think the government is effective in implementing the PhilGAP programme?

Other probing questions:

Food Safety:

- What are the different types of pesticides used in the banana plantation?
- What are the different pesticide operations employed in the banana plantation?
- How do you select the type of pesticide?
- How much pesticide do you apply per hectare basis?
- How often do you apply pesticides?
- How do you store and dispose unused, expired and empty pesticide containers?
- How different are the chemical residues in fruits, before and after practicing *PhilGAP* and/or other quality assurance programs?

Occupational Health & Safety:

- How do pesticide applicators regard pesticide operations before and after practising *PhilGAP* and/or other quality assurance programs?

Environment:

- What environmental issues did you experience with pesticides before and after practicing *PhilGAP* and/or other quality assurance programs?
- What other concerns or issues do you experience with *PhilGAP* and/or other quality assurance programs?

Interview Topic Guide for Type 2: Non-adopter of the *PhilGAP* certification programme, but have implemented another form of QMS certification

Background Questions

1. What is your official role in the company/banana plantation?
2. How long have you been working for the company / banana plantation?
3. What is the land area of the banana plantation (highland / lowland)?
4. What is the average planting density in a hectare?
5. How long has it been operating?
6. Which country do you export the bananas?

Philippine Good Agricultural Practices (*PhilGAP*)

7. What are your perceptions about the Good Agricultural Practices (GAP)?
8. Are you familiar with *PhilGAP* and the policies around it?
9. Does your company plan to apply for *PhilGAP* certification?
10. What other quality assurance certification program does your company comply with?
11. What are the different processes undertaken by the company to comply with the quality assurance certification?
12. How is it different from *PhilGAP* based on your experience?
13. What are the differences that you observed before and after complying with the current quality assurance programs?
14. What do you think are the major challenges for adopting *PhilGAP*?
15. What are the reasons for not applying for *PhilGAP* certification despite its adoption?

Other probing questions:

Food Safety:

- What are the different types of pesticides used in the banana plantation?
- What are the different pesticide operations employed in the banana plantation?
- How do you select the type of pesticide?
- How much pesticide do you apply per hectare basis?
- How often do you apply pesticides?
- How do you store and dispose unused, expired and empty pesticide containers?
- How different are the chemical residues in fruits, before and after practicing *PhilGAP* and/or other quality assurance programs?

Occupational Health & Safety:

- How do pesticide applicators regard pesticide operations before and after practising *PhilGAP* and/or other quality assurance programs?

Environment:

- What environmental issues did you experience with pesticides before and after practicing *PhilGAP* and/or other quality assurance programs?
- What other concerns or issues do you experience with *PhilGAP* and/or other quality assurance programs?

Interview Topic Guide for Type 3: Non-adopter of *PhilGAP* Certification Programme and have not implemented other forms of QMS certification

Background Questions

1. What is your official role in the company/banana plantation?
2. How long have you been working for the company / banana plantation?
3. What is the land area of the banana plantation?
4. What is the average planting density in a hectare?
5. How long has it been operating?
6. Which country do you export the bananas?

Philippine Good Agricultural Practices

7. What are your perceptions about the Good Agricultural Practices (GAP)?
8. Are you familiar with *PhilGAP* and the policies around it?
9. Does your company plan to apply for *PhilGAP* certification?
10. Does your company have quality assurance programme?
11. What other quality assurance certification program does your company comply?
12. How is it different from *PhilGAP* based on your experience?
13. What are the differences that you observed before and after complying with the current quality assurance programs?
14. What do you think are the major challenges for adopting *PhilGAP*?

Other probing questions:

Food Safety:

- What are the different types of pesticides used in the banana plantation?
- What are the different pesticide operations employed in the banana plantation?
- How do you select the type of pesticide?
- How much pesticide do you apply per hectare basis?
- How often do you apply pesticides?
- How do you store and dispose unused, expired and empty pesticide containers?
- How different are the chemical residues in fruits, before and after practicing *PhilGAP* and/or other quality assurance programs?

Occupational Health & Safety:

- How do pesticide applicators regard pesticide operations before and after practising *PhilGAP* and/or other quality assurance programs?

Environment:

- What environmental issues did you experience with pesticides before and after practicing *PhilGAP* and/or other quality assurance programs?
- What other concerns or issues do you experience with *PhilGAP* and/or other quality assurance programs?

Interview Topic Guide Key Informants: Bureau of Plant Industry (BPI) and Bureau of Plant Quarantine (PQS) Services Staff

Background Questions

1. How long have you been working with BPI?
2. What roles have you played in the company?

Philippine Good Agricultural Practices

3. How does the Food Safety Act affect the implementation of PhilGAP?
4. What are the current processes involved in the *PhilGAP* Certification Programme?
5. What are the roles of BPI during and after the transition period *PhilGAP*?
6. How does *PhilGAP* differ from *GLOBALGAP*?
7. What are your perceptions about *PhilGAP*?

***PhilGAP* in the Banana Plantation Industry**

8. Aside from *PhilGAP*, what other quality assurance program have been implemented in the banana plantation based on your knowledge? How different is it from *PhilGAP*?
9. What do you think of the perceptions of the banana industry about PhilGAP?
10. How was the information about *PhilGAP* communicated to the potential adopters?
11. At present, how many farms were compliant with *PhilGAP* and how will it change during or after the transition?
12. How many banana plantations applied for *PhilGAP* Certification?
13. What was the success rate? Or what were the factors affecting the success rate?
14. What are the reasons for adoption (drivers) and non-adoption (barriers) of *PhilGAP*?
15. What were the major areas of non-compliance?

Other Probing Questions:

- What were the major issues with respect to food safety before and after adopting PhilGAP?
- How has *PhilGAP* affected the pesticide usage in general? In bananas?
- How did BAFS monitor pesticide usage to ensure that it was in compliance with *PhilGAP*?
- What were the penalties for violating pesticide usage under the *PhilGAP* program?
- What were the major issues with respect to occupational health and safety of workers before PhilGAP adoption and how did it change after the adoption?
- What were the major environmental issues associated with the non-compliance of *PhilGAP*?
- How has adopting PhilGAP improved environmental problems?

Interview Topic Guide Key Informants: Bureau of Agriculture and Fisheries Standards (BAFS) staff

Background Questions

1. How long have you been working with BAFS?
2. What roles have you played in BAFS?
3. What is your role in relation to PhilGAP programme?

Philippine Good Agricultural Practices (*PhilGAP*)

4. What were the processes involved in the *PhilGAP* Certification Programme from the development of PhilGAP until its transition of implementation to the Bureau of Plant Industry (BPI)?
5. What is the role of BAFS during the transition period *PhilGAP*?
6. How does *PhilGAP* differ from *GLOBALGAP*?
7. What are your perceptions about the *PhilGAP*?

***PhilGAP* in the Banana Plantation Industry**

8. Aside from *PhilGAP*, what other quality assurance program have been implemented in the banana plantation industry based on your knowledge? How different is it from PhilGAP?
9. What do you think of the perceptions of the banana industry about PhilGAP?
10. How was the information about *PhilGAP* communicated to the potential adopters?
11. Prior to the transition, how many farms were compliant with *PhilGAP* and how will it change during or after the transition?
12. What was the success rate? Or what were the factors affecting the success rate?
13. What are the reasons for adoption (drivers) and non-adoption (barriers) of *PhilGAP*?
14. What were the major areas of non-compliance?

Other Probing Questions:

- What were the major issues with respect to food safety before and after adopting PhilGAP?
- How has *PhilGAP* affected the pesticide usage in general? In bananas?
- How did BAFS monitor pesticide usage to ensure that it was in compliance with *PhilGAP*?
- What were the penalties for violating pesticide usage under the *PhilGAP* program?
- What were the major issues with respect to occupational health and safety of workers before PhilGAP adoption and how did it change after the adoption?
- What were the major environmental issues associated with the non-compliance of *PhilGAP*?
- How has adopting PhilGAP improved environmental problems?

Appendix 4. Massey University Ethics Approval

Lindsay, Alice <A.Lindsay@massey.ac.nz> 8/2/16

to Spencer.Secret., David, Terry

Sent on behalf of Dr Brian Finch (Director of Ethics)

Dear Spencer

You will be aware that the Human Ethics approval and notification procedures include an audit of a sample of Low Risk Notifications so that we can assure our accreditation body that the low risk process is robust.

In March 2016 you submitted a low risk notification through the Human Ethics online system for your project, entitled, "Revisiting the Adoption of Philippine Good Agricultural Practices (PhilGAP): A Case Study of the Philippine's Cavendish Banana Plantations".

At an audit meeting held in June 2016, the above project was randomly selected by the Research Ethics Office for review by the Chairs of the Massey University Human Ethics Committees.
The Chairs provide feedback from the audit to researchers and, in this case, are pleased to confirm that the notification was deemed as meeting low risk criteria.

The Research Ethics Office is available to support your future notifications and applications and trusts that this research project proceeded satisfactorily.

Regards,
Alice

Alice Lindsay
Research Ethics Administrator
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