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Impact of International Experience and Innovation Capacity on the Export Performance of Vietnamese Agricultural SMEs

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ABSTRACT

International experience and innovation capacity are factors often related to the internationalization processes of firms. The main objective of this research is to investigate the impact of international experience and innovation capacity on the export performance of Vietnamese agricultural SMEs in order to identify which factor is more significant. The Resource-Based View and Dynamic Capabilities approach were used as theoretical frameworks. The data were analyzed through partial least squares structural equation modelling. The results indicate that international experience has a greater impact on export performance than innovation capacity, showing that there is possibility of overemphasizing the role of innovation capacity in the export performance of Vietnamese agricultural SMEs.

Keywords: export performance, innovation capacity, international experience, vietnamese SMEs
JEL Classifications: F10, F16, F18

I. Introduction

In recent years, more and more research confirms the importance of small and medium-sized enterprises (SMEs) for an economy's development. SMEs are responsible for a significant proportion of economic growth and new-job creation in developed and emerging economies (Robu, 2013). In addition, researchers acknowledge that promoting SMEs is a key strategy in achieving national development and competitiveness for emerging markets like Vietnam (Kazem & van der Heijden, 2006; Mourougane, 2012). According to the White Book on Vietnam's SMEs published by the Ministry of Plans and Investment (MPI) in 2016, 97 percent of enterprises in Vietnam are SMEs, in which 33% are services and agricultural. Although SMEs employ more than 70% of the workforce and contribute over 41% of the GDP in Vietnam (Can Van Luc, 2017), they are facing an array of obstacles in accessing credit, production sites and market expansion. Export value of Vietnam's agricultural products in 2016 reached more than USD 15 billion, an increase of 7.7% compared to 2015. However, in the last 5 years, while the total export

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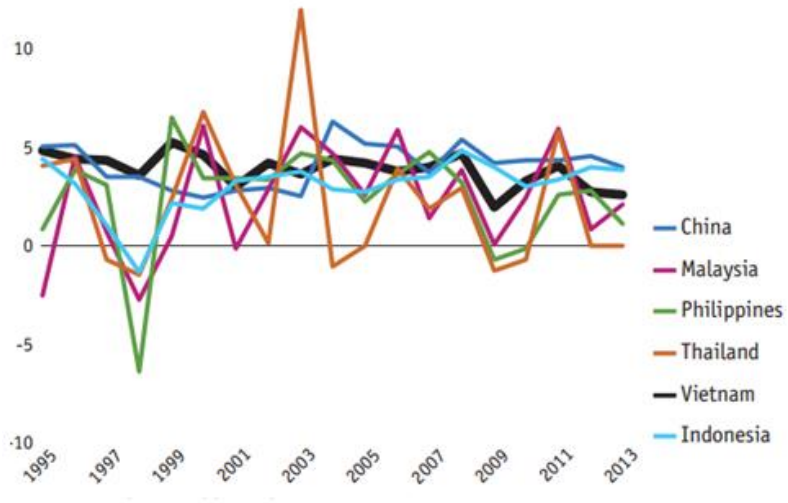
value recorded fairly high growth (average of 12.8% / year), the export of agricultural products faced many difficulties and the average growth was only 2.4%/year (Vietnam Customs, 2016) because of its low value added (less than 5%) (Fig. 1).

Fig. 1. Growth in Real Agriculture Value Added



Source: World Bank (2016).

Many agricultural SMEs are reticent about exporting due to a lack of resources and expertise, which are not suited to perceived risky ventures (Sommer, 2010). Understanding the factors that stimulate or inhibit exporting can effectively motivate Vietnamese agricultural SMEs to enter foreign markets (Leonidou, Katsikeas, & Samiee, 2004) and therefore strengthen their competitiveness. Based on a review of the literature so far, it is not clear which factor is more significant to the export performance of agricultural SMEs in Vietnam while remaining competitive in the international market. The key question facing policy makers recently is on how to improve export performance as well as the competitiveness of Vietnamese agricultural SMEs.

In this context, our study poses the following question: what is the impact of international experience and innovation capacity on the export performance of Vietnamese agricultural SMEs? It must be noted that this study is not designed to address the antecedents of innovation capacity or international experience, but to determine the degree to which each of these factors contributes to achieving better export performance in agricultural SMEs in Vietnam.

II. Literature Review and Hypothesis

2.1. Export Performance (EP)

EP is a variable that is essentially related to export activity. There is a multiplicity of determinants of export performance which can be understood by two broad theoretical approaches: the Resourse-Based View (RBV) and the Contingency Paradigm (with roots in the Industrial Organization Theory). The former approach is used to explain the internal factors that affect EP, while the latter approach examines the external factors. Firm capacities and international experience are internal determinants of EP (Zou & Stan, 1998); therefore, both innovation capacity and international experience have been analyzed using the

RBV. In brief, the RBV views companies as expanded sets of tangible and intangible resources (Mintzberg et al., 2000), where "resources include all assets, capabilities, organizational processes, firm attributes information, knowledge etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness". The RBV, however, is not free from criticism due to its static nature (Priem & Butler, 2001). In this sense, the Dynamic Capabilities (DC) approach introduced by Teece et al. (1997) appears to offer a more dynamic perspective of the RBV, suggesting the ability of a firm to change routines and reconfigure resources (including knowledge routines and knowledge resources) as the ultimate source of competitive advantage, with learning playing an important role (Vera, Crossan, & Apaydin, 2011). DC is defined as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997).

In this study, export performance is defined as "the extent to which a firm's objectives, both economic and strategic, with respect to exporting a product into a foreign market, are achieved through planning and execution of export marketing strategy" (Cavusgil & Zou, 1994).

2.2. Innovation Capacity (IC)

Innovation is defined as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (OCDE, 2005). However, IC is defined in numerous ways. Several terms found in the literature refer to this capacity as innovative capacity (Miranda et al., 2013), innovation capacity (Fleury et al., 2013), and international innovation capacity (Knight & Kim, 2009). Crossan and Apaydin (2010) view innovation as both a process and an outcome. RBV and Dynamic Capabilities support the analysis of determinants of innovation at organizational level, which is the case of IC in this research. As with the definition of innovation, IC measurement in studies on export performance remains undefined. In this paper, we defined IC as a construct consisting of seven dimensions: (1) R&D capacity; (2) marketing capacity; (3) manufacturing capacity; (4) learning capacity; (5) organizational capacity; (6) resource exploitation capacity; and (7) strategic capacity. It is assumed that there is a positive relationship between the innovation capacity and export performance of Vietnamese agricultural SMEs, leading to the following hypothesis:

H1: There is a positive relationship between the innovation capacity and export performance of Vietnamese agricultural SMEs.

2.3. International Experience (IE)

IE is accumulated over time and may be dependent on unique historical conditions. Therefore, in light of RBV, IE may be a resource imperfectly imitable, one characteristic that a resource must present to lead to sustained competitive advantage (Barney, 1991). In spite of the supposed importance of this variable for firms' competitiveness and performance, a review of the literature shows that research on the effects of IE on export performance remains in its infancy. As with innovation capacity, IE has been measured in several ways, but more homogenously. The measurements that have been used include the number of years dedicated to export activities (Stoian et al., 2011), the number of export countries and diversity of entry modes (Papadopoulos & Martı´n, 2010), and respondents' perceptions of personnel qualifications for addressing international operations, evaluated through psychometric scales (Beleska-Spasova et al., 2012). Overall, there is a positive relationship between IE and export performance in studies with exporters located in developed countries (Beleska-Spasova et al., 2012; Stoian et al., 2011). Considering that many studies seem to point to a positive relationship between international experience and export performance, H2 reflects this finding:

H2: There is a positive relationship between the international experience and export performance of Vietnamese agricultural SMEs.

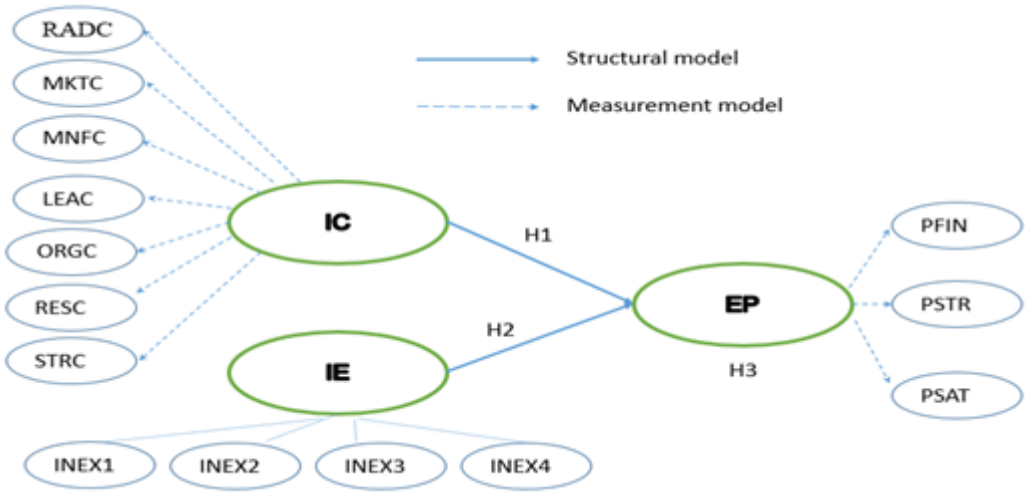
Finally, SMEs generally lack the financial resources accessible to larger or multinational companies and other resources necessary for conducting R&D. It becomes more obvious for agricultural SMEs. Furthermore, firm size is not always significantly associated with international experience (AbdulTalib, Salleh, Shamsuddin, & Ashari, 2011), which means that SMEs could probably compete over international experience better than innovation capacity. Therefore, it is assumed that, in general, IE affects the export performance of Vietnamese agricultural SMEs more heavily than innovation capacity. Thus, the third hypothesis aims to answer the research question fully.

H3: The influence of international experience on the export performance of Vietnamese agricultural SMEs is greater than that of innovation capacity.

2.4. Conceptual Model

Seven dimensions of IC as proposed by Guan and Ma (2003) are used in this research, and these are: R&D Capacity (RADC), Marketing Capacity (MKTC), Manufacturing Capacity (MNFC), Learning Capacity (LEAC), Organizational Capacity (ORGC), Resource Exploitation Capacity (RESC), and Strategic Capacity (STRC). In accordance with Beleska-Spasova et al. (2012), IE was operationalized as a one-dimensional construct composed of four indicators: company employs highly qualified staff to address the demands of international clients (INEX1), company employs staff with experience in international export operations (INEX2), company employs current knowledge of the export market (INEX3) and company employs information on conducting business in export markets (INEX4).

Fig. 2. Research Model



The EP construct was operationalized using the EXPERF scale presented by Zou et al. (1998), consisting of: Export Performance—Financial Dimension (PFIN), Export Performance—Strategic Dimension (PSTR), and Export Performance—Satisfaction Dimension (PSAT). Based on a review of empirical studies on the subject, Fig. 2 integrates the IC, IE and EP constructs. The relationship between IC and EP is tested by H1: The relationship between IE and EP is tested by H2. Finally, H3 compares the effects of IC and IE on EP.

III. Research Method

3.1. Sample

For the purposes of this study, Vietnamese agricultural SMEs were considered those with more than 50% Vietnamese capital and employing 20 to 499 employees. The model was tested on a sample of 82 Vietnamese agricultural SMEs. The data were collected through a survey using a structured questionnaire that was forwarded to those responsible for exports or foreign trade, following the approach of most studies on the subject. Regarding respondent profiles, 48.8% were managers, directors or presidents; 36.6% were supervisors, and 14.6% held lower positions, but were in charge of exports or foreign trade. Before the questionnaire was applied, IC measurement indicators were validated by five academic experts in the field of innovation. The other indicators were validated by four academic experts on internationalization. Subsequently, a pilot test for the questionnaire was conducted. Eleven exporters were contacted, but only five agreed to participate. No issues surfaced regarding comprehension of the questionnaire. However, some participants could not recall the first export year or the number of export countries served. The data were collected from April 6, 2017 to July 6, 2017.

3.2. Data Analysis

First, the Kolmogorov–Smirnov test was performed using SPSS software. We used PLS-SEM, which is suitable for nonparametric data analysis (Hair, Hult, Ringle, & Sarstedt, 2014) because the data were not distributed normally. Considering the need to test the hypotheses with latent variables measured by many indicators, structural equation modelling, consistent with the method used in several similar studies on EP (e.g., Beleska-Spasova et al., 2012) was used. The analysis of measurement models and the structural model followed the recommendations made by Ringle, Silva, and Bido (2014), Hair, Ringle, and Sarstedt (2011) and Hair et al. (2014). Measurement models were specified reflectively, and higher order latent variables (IC, EP) were specified following the recommendations of Wetzels, Odekerken-Shröder, and van Oppen (2009), who repeated first-order latent variable indicators among second-order latent variables.

IV. Research Results

Based on the measurement model results, research shows that the Average Variance Extracted (AVE) construct values are higher than 0.50 and that the indicators generated factor loadings (outer loadings) of at least 0.70. Thus, the initial values obtained fall within desirable limits, suggesting convergent validity for the AVEs and indicator reliability (Hair et al., 2014). To ensure convergent validity, internal consistency values, which are expressed by Composite Reliability (CR), must also be determined. Higher CR values correspond with higher levels of reliability, and a CR value of at least 0.70 is generally recommended (Hair et al., 2011). This value was achieved. Although CR values over 0.70 are recommended, values higher than 0.90 may reflect indicator redundancy (Hair et al., 2014). Some first-order constructs do not fit this situation (LEAC, STRC, ORGC, PSTR, PFIN, PSAT). To detect potential problems with the data collection instrument, each indicator was critically analyzed based on the meaning of each sentence, as were the response means and standard deviations. No redundancy problems were observed. Because indicators of first-order constructs were repeated in second-order constructs (Wetzels et al., 2009), high CR values may have also threatened the discriminant validity of the first-order constructs. To ensure that the constructs actually differed, the discriminant validity was tested using two methods recommended by Hair et al. (2014): (1) analysis of indicator cross-loadings and (2) the Fornell and Larcker criterion. Concerning the cross-loadings analysis, the loadings of the indicators in their respective constructs were higher than those of the other constructs. Hence, discriminant validity was generated using the first method (Hair et al., 2014). The Fornell and Larcker criterion involves comparing the square root of the AVEs of constructs with

correlations between constructs, and the square root obtained should be higher than the correlations to ensure discriminant validity (Hair et al., 2014). An analysis of the square roots for both first- and second-order constructs (Table 1) shows that the results meet the Fornell and Larcker criterion, confirming the discriminant validity of the model using the second method.

Table 1. AVE Square Roots

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
Innovation Capacity (Second – order)	4.44	1.48	.713	0	0	0	0	0	0	0	0	0	0	0	0
RADC (First order)	4.32	1.42	.654	.834	0	0	0	0	0	0	0	0	0	0	0
MKTC (First order)	4.36	1.37	.578	.433	.765	0	0	0	0	0	0	0	0	0	0
MNFC (First order)	3.89	1.19	.138	.127	.567	.783	0	0	0	0	0	0	0	0	0
LEAC (First order)	3.97	1.28	.256	.357	.348	.347	.923	0	0	0	0	0	0	0	0
ORGC (First order)	4.53	1.27	.562	.222	.654	.222	.365	.941	0	0	0	0	0	0	0
RESC (First order)	5.06	1.15	.436	.178	.189	.568	.284	.748	.844	0	0	0	0	0	0
STRC (First order)	4.98	1.33	.357	.379	.278	.452	.179	.658	.326	.785	0	0	0	0	0
Export Performance (second-order)	4.27	1.67	.479	.685	.482	.622	.298	.843	.578	.475	.867	0	0	0	0
PSTR (first-order)	3.94	1.54	.441	.735	.306	.671	.747	.763	.245	.398	.159	.904	0	0	0
PFIN (first-order)	3.95	1.45	.367	.567	.358	.538	.654	.386	.167	.325	.256	.345	.834	0	0
PSAT (first-order)	3.87	1.28	.269	.349	.427	.174	.577	.438	.379	.178	.457	.544	.367	.905	0
International Experience	4.95	1.32	.402	.403	.328	.479	.386	.479	.567	.622	.358	.277	.542	.479	.822

Note: N = 82. Numbers in bold refer to the square roots of AVEs for constructs calculated manually. The remaining data were obtained from the SmartPLS 2.0 Algorithm module using the following parameters: Missing value algorithm = Case Wise Replacement:Weighting scheme = Path weighting scheme, Data metric = Mean 0, Var 1, Maximum iterations = 300, Abort criterion = 1.0E 5, and Initial weights = 1.0.

The model's convergent and discriminant validity has been confirmed, and the results of the structural model have been reported. The R square values, which reflect endogenous variable variance explained by the structural model (Ringle et al., 2014), were the following: LEAC (R2 = .730), STRC (R2 = .802), MKTC (R2 = .670), MNFC (R2 = .705), ORGC (R2 = .683), RADC (R2 = .674), RESC (R2 = .813), EXPORT PERFORMANCE (R2 = .215), PSTR (R2 = .901), PFIN (R2 = .741) and PSAT (R2 = .809). The R2 of .215 for the main model construct, Export Performance, suggests a moderate effect among the behavioral and social sciences areas, according to Cohen (1998) and Ringle et al. (2014). The data presented in Table 2 were used to evaluate the significance of the construct relationships.

First, the relationships between the seven IC dimensions and IC construct were found to be positive and significant. Learning Capacity (LEAC) had the highest coefficient (0.901, $t = 51.237$, $p < .01$), while R&D Capacity (RADC) had the lowest coefficient (0.726, $t = 19.547$, $p < 0.01$).

Table 2. Total Effects

Related Hypotheses	Paths	Original Sample (path coefficient)	Mean	Standard Error	t Test	Significance
H1 and H3	Innovation Capacity → LEAC	.901	.837	.017	51.237	P<.01
	Innovation Capacity → STRC	.882	.905	.023	43.624	P<.01
	Innovation Capacity → MKTC	.733	.755	.035	28.517	P<.01
	Innovation Capacity → MNFC	.817	.852	.023	33.835	P<.01
	Innovation Capacity → ORGC	.870	.806	.041	41.273	P<.01
	Innovation Capacity → RADC	.726	.784	.014	19.547	P<.01
	Innovation Capacity → RESC	.784	.816	.028	32.164	P<.01
	Innovation Capacity → Export Performance	.225	.217	.098	2.345	P<.05
	Innovation Capacity → PSTR	.213	.231	.093	2.303	P<.05
	Innovation Capacity → PFIN	.306	.241	.086	2.341	P<.05
	Innovation Capacity → PSAT	.174	.276	.092	2.102	P<.05
	Export Performance → PSTR	.912	.204	.018	84.312	P<.01
	Export Performance → PFIN	.903	.608	.014	55.627	P<.01
	Export Performance → PSAT	.837	.253	.038	22.436	P<.01
H2 and H3	International Experience → Export Performance	.314	.318	.125	2.873	P<.01
	International Experience → PSTR	.248	.264	.093	2.824	P<.01
	International Experience → PFIN	.289	.249	.089	2.475	P<.01
	International Experience → PSAT	.254	.215	.091	2.987	P<.01

Note: The data were obtained from the Bootstrapping module of SmartPLS 2.0 using the following parameters: Missing value algorithm = Case Wise Replacement: Apply missing value algorithm = Yes, Sign changes = No sign changes, Cases = 82, and Samples = 3000.

Secondly, the three EP dimensions were also positive and significant. An analysis of the relationships between IC and EP (0.225, $t = 2.345$, $p < 0.05$) and IE and EP (0.314, $t = 2.966$, $p < 0.01$) also showed that both were positive and significant, supporting Hypotheses H1 and H2. Thirdly, the effect of IE on EP (0.314, $t = 2.873$, $p < 0.01$) was found to be greater than the effect of IC on EP (0.225, $t = 2.345$, $p < 0.05$), confirming H3.

V. Discussion and Conclusion

Our research contributes to the literature on export performance by explicitly comparing the role of innovation capacity (IC) and international experience (IE) in the export performance (EP) of agricultural SMEs in Vietnam and reveals some interesting findings.

The first finding shows that the current literature could be overemphasizing the relevance of IC regarding company's performance. We found in Vietnamese agricultural SMEs that both IC and IE had a significant positive impact on EP and that the impact of IE was even greater than that of IC, confirming H3. IE is one of the main explanatory variables of company growth in the internationalization process (Eriksson et al., 1997) and some studies have assessed its impact on EP. The results obtained in this paper confirm the importance of this variable in improving EP.

The second finding is related to the IC learning capacity dimension. Efforts were made to organize the literature cited in this study and adopt the Resource-Based-View theory suitable for research on EP. The model is novel in terms of how IC and EP constructs are integrated. This finding is consistent with the

Dynamic Capabilities approach, where learning plays an important role in enabling a firm to change its routines and reconfigure resources. Accordingly, the model allows us to make a further evaluation of the role of IC in EP, primarily for agricultural SMEs in Vietnam.

The third finding reveals that although H3 has been confirmed, this result warrants careful analysis for two reasons.

First, 68.3% of agricultural SMEs in the sample export mainly to developing countries like China and ASEAN countries, which are likely to require lower IC than developed economies. Moreover, Vietnamese agricultural SMEs seem to prefer such destinations not just because it is supposedly easier to introduce new products in these markets but also because emerging-country firms (i.e. Vietnamese firms) are accustomed to operating in countries with poor governance conditions, as is often the case in underdeveloped economies. This seems to be a reasonable explanation if we take into consideration the fact that it is not enough for Vietnamese SMEs to have IC to export products. In addition, Vietnamese agricultural SMEs must know how to overcome many problems in their own country, such as high logistics costs and inadequate infrastructure, among others, which are similar to those found in their main product-market export ventures.

Second, the result also requires reflection when examined in light of the RBV. According to the RBV, companies compete over resources, which are central to achieving a sustainable competitive advantage (Aaker, 1989). Based on this understanding, it can be concluded that companies also compete over international experience and innovation capacity. Both resources are accumulated over time and can therefore be considered strategic resources (Barney, 1986). However, a strategic resource must meet four attributes to generate a sustainable competitive advantage: (1) it must be valuable; (2) it must be rare among current and potential competitors; (3) it must be imperfectly imitable; and (4) there cannot be strategically equivalent substitutes for the preceding attributes (Barney, 1991). Of these four attributes, perhaps the least difficult to analyze at this moment is the imperfectly imitable resource. Although IE affects EP to a greater degree, according to the RBV, it may be more perfectly imitable than IC in strategic terms. This can be attributed to the fact that companies can typically hire executives from competitors and publish online information on countries where they are based, fairs in which they participate, and countries where they employ sales representatives. This renders international experience more imitable. IC, by contrast, involves knowledge that is tacit and difficult to replicate, such as R&D capacity, rendering imitation highly unlikely. Thus, complementing the answer to the main question of this research, in strategic terms, IC appears to be more relevant than IE in obtaining a sustainable competitive advantage for agricultural SMEs in Vietnam. However, obtaining good EP, IC and IE should be viewed as complementary, even though IE's impact proved to be more significant than that of IC, and this finding may be seen as the main contribution of this study. It should be noted that while IE is a simpler construct than IC, this does not necessarily mean that it is easier to increase or that it requires less investment, although this issue falls outside the scope of this study.

Nonetheless, this research can guide future research on ways in which exporting agricultural SME managers may optimize scarce resources and in the development of public policies that encourage exports. Concerning the managerial implications, this paper reinforces the fact that investing only in IC may not be sufficient to improve EP. Firms must balance investments, heavily considering the importance of improving international experience to achieve better EP.

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An Analysis on the Market Potential of Cacao Charcoal Briquettes in Los Baños, Laguna, Philippines

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ABSTRACT

Due to increasing cacao production in the Philippines, agricultural waste from chocolate production also increased. With this, the CocoaPhil Foundation developed cacao husks into new products, namely charcoal briquettes, to fully utilize cacao waste and provide an alternative to wood charcoal. The study aimed to analyze the market potential of cacao charcoal briquettes in Los Banos, Laguna. Specifically, it aimed to assess the potential demand and devise strategies for commercialization. A survey was conducted among 19 large-scale vendors, 41 small-scale vendors, and 50 household consumers. Focus group discussions, usage, an attitude and image study, price point analysis and product attribute ranking were used to assess the data. Results showed that there was a very low awareness level among all segments. Household consumers exhibited a higher level of willingness to purchase and use the product compared to the other two segments. The study revealed that the major factors affecting consumers' decision were price and availability of the product. After evaluating the market potential of the product in Los Banos Laguna, it was concluded that there was potential for cacao charcoal briquettes, but to fully commercialize the product, positioning should be changed to better fit the market.

Keywords: cacao charcoal, commercialization, demand, market potential
JEL Classifications: M31, O32, Q13

I. Introduction

Based on a survey conducted by the National Statistics Office (NSO) and the Department of Energy (DOE), it was inferred that despite the presence of electricity and LPG as a source of energy, more than half of Philippine households still use charcoal for daily energy needs. Due to this, charcoal producers in the country were compelled to significantly increase wood charcoal production to meet daily household demand. However, charcoal production in the country is still being done traditionally, wherein trees are illegally cut and burnt down. Due to this, the Department of Environment and Natural Resources (DENR) banned the production of wood charcoal and all underlying activities to prevent the further depletion of the country's forests.

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In line with the aforementioned situation, engineers had been trying to develop more sustainable and environment friendly alternatives to wood charcoal. The Department of Environment and Natural Resources-Ecosystems Research and Development Bureau (DENR-ERDB) developed charcoal briquettes derived from different species and material combinations, including urban waste and agricultural waste. These materials include coconut husks, corncobs, sugarcane bagasse and most recently, cacao pods.

The CocoaPhil Foundation had been eager to develop new products from the cacao wastes brought by the production and processing of cacao in its plant in Davao, Philippines, with an annual production of 0.99 tons or 900 kilograms. Although cacao charcoal briquetting has been done since 1993, the foundation was still in the product development stage, wherein it was still trying to improve the overall appearance and performance of the product to attract a market. In line with this, through the research and technology available in the ERDB, the foundation had partnered with the bureau to standardize and further improve the product. Furthermore, the ERDB was equipped with the proper technology needed for the production of cacao charcoal briquettes. Through this, the foundation, along with the ERDB, looked into the possibility of encouraging the use of cacao charcoal briquettes as an alternative to wood charcoal in Los Baños, Laguna, in order to lessen the harmful effects of charcoal production as well as fully utilize cacao wastes.

CocoaPhil intended to test the product in Los Baños, Laguna, due to the number of grilled food enterprises, both large-scale and small-scale, present in the area. These two segments were considered the main possible market for the product. Due to the inadequate supply of raw materials in previous years, the cacao charcoal briquettes were not successfully commercialized. However, due to the forecasted global demand of 5,000,000 MT cacao beans and targeted 100,000 MT cacao bean production by 2020 (Philippine Rural Development Project, 2014), different provinces such as Laguna, Quezon Province, Bicol, and Mindoro have expanded cacao plantations and increased production. Almost 8,000 hectares of land are to be used for 9,600,000 cacao seedlings to further boost production (Kenmer Foods International, 2014). In anticipation for the large amount of waste brought about by the increased production of chocolate in the next few years, the foundation also anticipated the large amount of waste that goes along with it. In line with this, it was necessary to determine the market potential of cacao briquettes in anticipation for the amount of cacao waste in the next five years.

II. Objectives of the Study

The general objective of this study was to identify potential buyers, determine potential demand and devise commercialization strategies for cacao charcoal briquettes in Los Baños, Laguna, Philippines. Specifically, it aimed to (1) present a profile and describe the behavior of the buyers of the product being studied; (2) determine qualitative requirements of the buyers and estimate the market size of the product being studied; (3) identify potential marketing opportunities, issues, and problems in meeting the demand of the buyers; and (4) formulate general strategies to address these issues and opportunities

III. Methodology

The study primarily used a descriptive research design in assessing the market potential of cacao charcoal briquettes in Los Baños, Laguna, Philippines. It described the buying and consumption behavior of wood charcoal users and the degree by which the respondents were willing to use cacao charcoal briquettes as an alternative in the area. Moreover, the study used a single-cross sectional design wherein the information from the target population was obtained from the sample only once.

A survey was conducted among 110 respondents consisting of small-scale grilled food enterprises and large-scale grilled food enterprises as well as households currently using charcoal. Complete enumeration

was used to identify the large-scale grilled food enterprises while convenience sampling was used in the case of small-scale grilled food enterprises, wherein 41 respondents were identified based on the availability and accessibility of the respondents. Lastly, 50 household respondents were identified using purposive sampling to gauge the possibility of catering to households in Los Baños, Laguna, since research (Mercurio, 2014) showed that more than 50% of households are still active charcoal users.

Focus group discussions (FGD) were conducted in order to identify the characteristics that the possible market like or dislike about the product. Moreover, the FGD helped in evaluating and benchmarking the position of cacao charcoal briquettes relative to wood charcoal in the market.

A home placement test was administered among the 19 large-scale grilled food vendors, 41 small-scale grilled food vendors, and 50 charcoal-using respondents in Los Baños, Laguna. Each respondent was given 1 kg of cacao charcoal briquettes to test in their homes or enterprises for one week. Furthermore, a market and consumer survey was conducted alongside the home placement test to identify demographic characteristics, buying behaviors, and current practices as well to establish the desired and undesired characteristics of the product and identify the potential demand. The price point analysis was also incurporated in the survey in order to identify the price at which the respondents find the product cheap, expensive, unaffordable, and of low-quality. The Usage, Attitude and Image Study was used to analyze the data gathered through the use of the market and customer behavior survey. The product attribute ranking was determined through the survey that was administered after the product test. The respondents were asked to rank a specific attribute as to whether they extremely dislike (1), dislike (2), somewhat dislike (3), neither like nor dislike (4), somewhat like (5), like (6), and extremely like (7) the attribute. This was used to determine which among the attributes of cacao charcoal briquettes and wood charcoal were of greater importance to the respondents.

The data gathered from the FGD, UAI, home placement test and consumer market survey were analyzed through the use of statistical tools. Frequency counts and percentage distributions were used to analyze the information obtained from the market and consumer behavior survey. Mean ratings and rankings were used in analyzing the characteristics. Measures of central tendency, namely the mean, median, and mode, were also used to determine distribution of the socio-demographic characteristics of the respondents.

The data gathered were then summarized to assess the market potential of cacao charcoal briquettes in Los Baños, Laguna, and were used to devise strategies for the commercialization of the product.

IV. Review of Literature

A study has been conducted by the DENR-ERDB comparing the performance of wood charcoal to cacao charcoal briquettes. The experiment used 1 kilogram of cacao charcoal briquettes and 1 kilogram of wood charcoal in a household setting under controlled conditions wherein Respondent A was tasked to boil water using wood charcoal and Respondent B was tasked to boil water using cacao charcoal briquettes. Based on the study, it showed that the time it took to ignite the wood charcoal and the cacao charcoal briquettes were relatively the same at an average of 0.5 minutes. However, the experiment also revealed that it was easier to ignite the cacao charcoal briquettes since wood charcoal required another 0.5 minutes to fan and fully ignite the flames. In addition, during the experiment, Respondent A had to add more wood charcoal in order to sustain the flames, which was taken as an implication that the burning period of the cacao charcoal briquettes was longer than that of wood charcoal. The product test showed that cacao charcoal briquettes can continuously maintain output intensity for 50-60 minutes, whereas wood charcoal can only sustain flames for 35-45 minutes. After 45 minutes, Respondent A had to add more wood charcoal and fan the flames again.

Other attributes that were noticed during the test were the absence of smoke and odor from cacao charcoal briquettes as well as a more organized formation of ash compared to those of wood charcoal. The wood charcoal, on the other hand, had a very distinct smell of smoke, and its ashes were scattered and messy.

Charcoal briquetting is very important, especially at this day and age. The Philippine forests are greatly in danger due to the rising demand for charcoal all over the Philippines. However, if agricultural waste is utilized properly for producing renewable energy in the form of charcoal briquettes, then it can lessen the wood charcoal consumption of poultry farms, households and other domestic businesses. It will help mitigate carbon dioxide emissions in the atmosphere. It will lessen the cutting of trees from the country's forests and it will put abandoned biomass and agro-forestry waste to a good use. Moreover, using briquettes instead of wood charcoal will help conserve about 88 trees (Baconguis, 2015).

In addition, high quality charcoal briquettes can replace expensive imported fossil fuels. The utilization and conversion of abandoned biomass to charcoal briquettes will help communities be free from waste. According to DENR, charcoal briquetting can serve as an additional or alternative livelihood to alleviate poverty, especially for the underprivileged. Charcoal briquetting generates enormous livelihood activity in urban and rural communities. Unutilized and underutilized labor can be tapped such that it will spur the growth of the local economy. Moreover, carbonized waste cellulosic materials can now be traded by the impoverished, improving their way of living. Charcoal briquetting may create employment in areas in the Philippines since abandoned biomass can be found everywhere and unskilled labor can be tapped. Very little capital is required and charcoal briquettes can be an export commodity, aside from supplying the needs of the tobacco industry. Lastly, briquettes can be substituted for expensive LPG as household energy for cooking, ; hence, reserve currency can be saved (Baconguis, 2015).

In a similar study conducted in Haiti, charcoal briquette could be technically acceptable as a substitute for fuel for nearly all charcoal uses and for many firewood uses for cooking and commercial process heat. However, the target markets should be narrowed according to the briquette's price competitiveness. In the study, the specific market that was tested was in Port-au-Prince, a primary charcoal market. It shows that cacao charcoal briquettes have the potential to compete successfully in a primarily wood charcoal market, which implies that other markets could be exploited. From the study, it was inferred that if charcoal briquettes in general could not penetrate a primarily charcoal market, then it would have a difficult time competing in other areas in Haiti. Moreover, it was established that the existing participants in the wholesaling, transport, and retailing of wood charcoal expressed a willingness to handle coal briquettes, which poses little difficulty in developing distribution capabilities. It is expected that the product could be sold to wholesalers either at the factory where it is produced, or at a wholesale depot near Port-au-Prince after bulk transport from the factory. At the point of sale, the wholesalers and/or retailers would have a responsibility to pack the briquettes in bags and do the final distribution and selling. These were the accepted practices in the charcoal trade in Haiti.

The study also showed that the prices must be very competitive considering wood charcoal is being sold at relatively competitive prices. It was also assumed that a coal briquette could perform comparably to charcoal for the purpose of analysis. Given so, the cacao charcoal briquette's price must be comparable per unit of calorific value as charcoal. Moreover, further marketing analysis should be done in order to fully identify the pricing of the briquettes in Haiti.

V. Results and Discussion

5.1. Profile of the Respondents

5.1.1. Large-Scale and Small-Scale Grilled Food Enterprises

Among the 19 large-scale grilled food enterprises that were surveyed, 7 of which are franchises of common household brands for grilled food, namely Baliwag, Sr. Pedro, Andok's, and Mr. Liempo. The other 12 enterprises are independent private brands. Mostly, the respondents of this segment have finished high school and have a household size of 6. The respondents also had an average income of P 11,500 monthly.

In the case of small-scale grilled food enterprises, the survey revealed that the average age of vendors is 36 and the average level of education is secondary. The survey also showed that the average household size is 7 and the monthly income is roughly around P 9,853.66. All of the vendors were female, 15 of which are married and 35 single.

Table 1. Socio-Demographic Profile of Large-scale and Small-scale Grilled Food Enterprises

		Average	**Minimum**	**Maximum**	**Mode**
Age	Small-Scale	36	22	56	22
	Large-Scale	21	21	61	22
Household size	Small-Scale	7	3	9	8
	Large-Scale	5	3	6	6
Monthly Income (in Php)	Small-Scale	9853.659	4000	95000	6000
	Large-Scale	11500	7000	30000	8000

5.1.2. Household Respondents

A total of 50 households were surveyed for the study. The average age of those interviewed was 43 years old, while the minimum and maximum ages are 21 and 60 respectively. On average, respondents were age 50 and have finished high school. The household size was mostly 7, and the monthly income is P 12,000. Among those surveyed, 29 of which are female while 21 are male. Moreover, 78% of the respondents are married and the remaining 22% are single.

Table 2. Socio-Demographic Profile of Household Respondents

Variables	**Average**	**Minimum**	**Maximum**	**Mode**
Age	43	21	60	50
Household Size	7	3	9	7
Monthly Income	32000	0	110000	12000

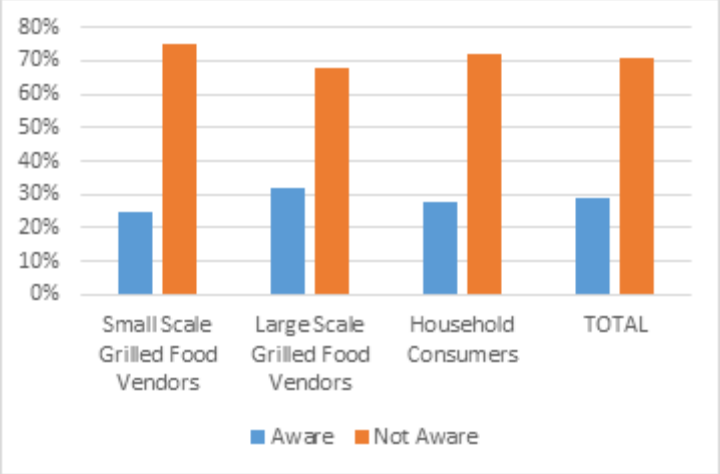
5.2. Buying Behavior and Frequency of Use

The buying behavior and frequency of use of charcoal among the respondents differs due to the difference in the nature of operations for the enterprises and the need of the households for charcoal. In terms of usage, the large-scale grilled food enterprises consumed an average of 2-3 sacks, or 27 kilograms, of charcoal daily. This translated to an average spending of almost Php 500.00 daily. The small scale grilled food vendors, on the other hand, used an average of 5 kilos daily, which costs around Php 50.00. Lastly, household consumers used charcoal to prepare everyday meals and for special occasions such as birthdays, outings, and gatherings. Among the 50 respondents, 73% used charcoal on an everyday basis while the remaining 27% used charcoal only when they prepared grilled food for special occasions. An

average household consumed 1 kilogram of charcoal per use, which translates to 3 kilograms per day, and a daily cost of Php 15.00.

In terms of sources of charcoal, most large-scale enterprises (63%) sourced their supply from suppliers in the public market. The remaining 37% sourced the supply from franchise suppliers. The survey also revealed that 68% of the respondents purchase or replenish their supply of charcoal monthly, while 32% purchase their supply weekly. In the case of small-scale enterprises, all respondents sourced their charcoal from the public market. Moreover, 61% of the small-scale vendors purchased charcoal daily, 29% purchased charcoal weekly and 10% of the respondents had no definite time of purchase, and it was purchased when the need arose. Lastly, household consumers usually buy charcoal when the need arises. For those who used charcoal for everyday meals, they usually buy the charcoal from the public market on a daily basis.

Fig. 1. Awareness Level of Charcoal Briquettes among the Respondents



5.3. Awareness Level for Cacao Charcoal Briquettes

The respondents were asked if they were aware of charcoal briquettes prior to the product test.

In general, out of 110 respondents, 29% or 31 respondents were aware or had heard of the new product. From the large-scale respondents, out of the 19, only 26% had heard or seen charcoal briquettes prior to the test. In the case of small-scale enterprises, 32% of them were aware of the technology, while in the case of household consumers, 14 out of 50 respondents, or 28%, had heard of the charcoal briquette. However, looking at the extent of knowledge about the product, the respondents who had heard of the charcoal briquette have little knowledge about the product. Out of the 110 respondents, only 18% have actually used a charcoal briquette derived from agricultural waste such as twigs and leaves. However, none had tried using or had heard about cacao charcoal briquettes.

5.4. Product Attribute Analysis

In assessing the market potential of the cacao charcoal briquette, it was also imperative to look at the most important product attributes that customers liked about the cacao charcoal briquette. The study tested six product attributes of charcoal, and the respondents were asked to rate these attributes from 1 to 7, wherein 1 represents extremely dislike and 7 represents extremely like. These six attributes are presence of ash, presence of smoke, odor, output intensity, burning time and time of ignition.

Based on the survey, large-scale enterprises, in general, preferred the qualities of the cacao charcoal briquette versus the traditional charcoal. Specifically, they liked that the charcoal did not produce smoke, the burning period was longer and output intensity was high. The small-scale enterprises did not like the attributes of the cacao charcoal briquette since it did not produce smoke and there was no charcoal odor. For them, these were non-negotiable attributes for charcoal since the presence of smoke and strong odor were some of the most important "attracting" factors for their business. Lastly, most of the households liked the quality of the briquettes having a longer burning time without being fanned and without adding more charcoal to sustain heat. In addition, the characteristic that they appreciated the most was the lack of smoke, which keeps their houses from smelling and allows them to cook meals indoors.

Table 3. Product Attribute Rankings for Cacao Charcoal Briquette per Market Segment

Attributes	Mean Score		
	Large Scale Enterprises	Small Scale Enterprises	Household Consumers
Time of ignition	4.37	6.05	5.05
Output Intensity	5.37	6.00	5.28
Burning time	5.26	5.80	5.15
Presence of ash	5.89	5.12	6.08
Odor	5.52	5.04	5.93
Presence of Smoke	6.11	4.12	6.02

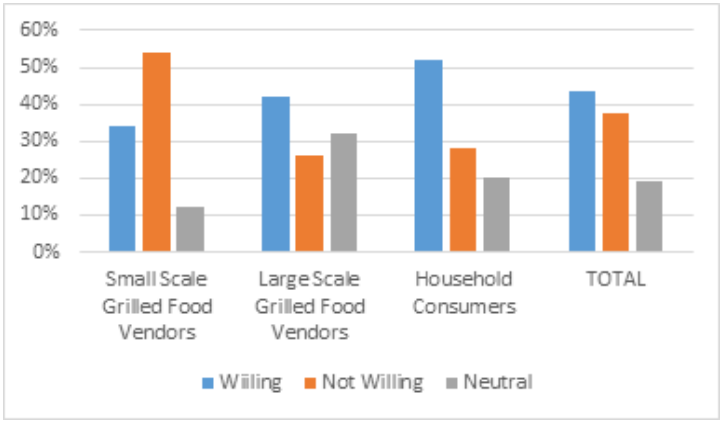
5.5. Price Sensitivity Analysis

The respondents were asked about perceptions of the product based on price with respect to knowledge on the current prices of wood charcoal in the market. Most of the large-scale respondents considered the product cheap if it were priced at Php8/kilo, while the product is considered expensive if it were priced at Php40/kilo. Most of the large-scale respondents also considered the product as unaffordable if it were priced at Php60/kilo and perceived the product to be of low quality if it were priced at Php10/kilo.

The small-scale respondents, on the other hand, mostly considered briquettes to be cheap if they were priced at Php10/kilo, and considered the product expensive if it were priced at Php15/kilo. Most respondents found Php30/kilo unaffordable and considered Php5/kilo to be of low quality.

Lastly, based on the survey, most households considered briquettes to be cheap at Php10/kilo, expensive at Php20/kilo, unaffordable at Php24/kilo, and the product having low quality at Php9/kilo.

Fig. 2. Willing to Purchase Cacao Charcoal Briquettes among the Respondents



5.6. Willingness to Purchase

Upon evaluation of the product attributes of cacao charcoal briquette versus traditional wood charcoal, respondents were also asked about their willingness to purchase the new product. The survey revealed that out of the 110 respondents, 44% were willing to purchase and use cacao charcoal briquettes while 37% of the respondents were not willing to purchase the product. The remaining 19% were neutral about cacao charcoal briquettes. Breaking it down into segments, the survey revealed that 42% of the large-scale enterprises were willing to purchase and use cacao charcoal briquettes. However, the supply of charcoal for each large-scale enterprise was mostly sourced from franchises or from suppliers in the public market; thus, the decision would come from management. This is also the reason why 32% of the respondents chose to stay neutral regarding the purchase of the product despite the preference of briquettes over wood charcoal. Moreover, 26% of the large-scale respondents were not willing to purchase the briquettes due to the fact that they are more expensive than wood charcoal.

The respondents for the small-scale vendors, on the other hand, showed that 54% are not willing to purchase the briquettes on the grounds that the product is more expensive than the wood charcoal. The vendors claim that upon the adoption of the product, they will have to increase their selling prices as well. In addition, the briquettes do not produce much smoke, which is also one variable that lead to the decision. However, 34% of the respondents were willing to purchase to the briquettes and 12% stayed neutral.

Lastly, 52% percent of the household respondents were willing to use charcoal briquettes as an alternative for wood charcoal provided that the product will remain at P12-15/kilo since it is more economical in the sense that its burning period and fire quality are better than those of the charcoal. However, 28% of those surveyed showed that they are not willing to use the briquettes as an alternative since they are more used to charcoal and because of its convenience. Moreover, 20% of the respondents remained neutral about adopting the briquettes.

5.7. Estimated Market Potential

Based on the computed figures and values obtained from the survey, the market potential for cacao charcoal briquette in kilos was estimated. For the large-scale segment, there is a total of 129,600 kilos demanded for 12 establishments annually. Given that the current price per kilo of cacao charcoal briquettes is Php 15, there will be an estimated demand would be Php 1,944,000 per year. The small-scale enterprises, on the other hand, have an estimated demand of 34,200 kilos annually from a total of 19 establishments. Given this, there will be a total estimated demand of Php 513,000 per year. Lastly, the estimated demand of household respondents is at 28,080 kilos per year. With the price of cacao charcoal briquettes at Php 15/kilo, the demand value would be Php 421,000. Given these figures, the segment with the most potential would be that of the large-scale grilled food enterprises.

Table 4. Estimated Market Potential for Cacao Charcoal Briquettes in Los Baños Laguna

Potential Market	Estimated Demand (kilos)	Price (Php/kilo)	Demand Value (Php)
Large-scale	129,600	15	1,944,000
Small-scale	34,200	15	513,000
Households	28,080	15	421,000

5.8. Commercialization Strategies for Cacao Charcoal Briquettes

5.8.1. Large Scale Grilled Food Enterprises

The product attributes that the large-scale employees like the most are the burning period, the quality of the fire, the absence of smoke and the few ashes produced. However, since the enterprises bulk

purchase charcoal , the product should be packed in sacks with a seal of the brand or product name and include instructions on use. The inclusion of the product name or brand in the packaging is important in order to set the product apart from the other charcoals in the market and distinguish the type of charcoal. The instructions for use are also necessary as a guide on how to use the briquettes properly. The foundation may opt to use their warehouse as the distribution channel, wherein they may bulk deliver to other large-scale enterprises. Moreover, in order to increase the awareness of the product, it is suggested that the product be promoted through word-of-mouth. It is also suggested that the distributor of cacao charcoal briquettes engage in x-deals with their clients, such as offering a 50% discount for a minimum bulk purchase.

5.8.2. Small Scale Grilled Food Enterprises

The small-scale vendors were not convinced with the performance of the product as certain qualities such as smoke and odor were lacking. Moreover, since these small enterprises purchase charcoal per kilo, the product is preferred to be packed in bags with an instructions on use since the product comes off as "intimidating" to some vendors. The instructions for use are also necessary to serve as a guide to use the briquettes properly and make it more user-friendly. The small-scale vendors prefer the cacao charcoal briquettes be distributed in the common marketplaces in which most small-scale vendors currently purchase the charcoal that they use for business. The product has to be readily available and, at the same time, accessible to the target market to make it more convenient for small-scale vendors. Moreover, it would be unwise of the foundation to cater to this segment since this segment generally is not in favor of the product.

5.8.3. Household Consumers

If the foundation were to target the households, since the general profile of the sample size shows that they are belonging to the lower-middle to the lower income, then the organization should position its product similar to that of wood charcoal. The charcoal should be offered in bags, but with instructions on how it is to be used in a household setting in order to give a non-intimidating vibe, as the respondents pointed out in the survey. Just like those of the small-scale vendors, the common sentiment of the households is that they are usually being offered in supermarkets and hardware stores, which makes the product more expensive. Due to this, it is best that the briquettes be sold at the marketplace where most of the households purchase charcoal, and that households be able to find the product more accessible.

5.9. Potential Problems

Based on the study, all three segments showed very low awareness of the product. This poses a potential problem since low awareness results in little to no demand. Moreover, very intensive marketing and advertising efforts will have to be conducted to increase awareness of the product.

In addition, due to the insufficient supply of inputs in the previous years, CocoaPhil has no prior experience in mass-producing cacao charcoal briquettes. Therefore, the ability of the foundation to supply briquettes in large volumes has not been established yet.

VI. Conclusion and Recommendation

Since 52% amongst the 50 households surveyed showed a willingness to purchase and use the briquettes, it is recommended that future studies conduct more intensive research, particularly for the use of the product for households only. Moreover, other segments, such as restaurants and bakeries, private resorts, and post-harvest processors (drying), can be considered since these segments are also heavy charcoal users.

The cacao charcoal briquettes have been produced since 1993; however, up to the present, they still have a very low level of awareness in the market. Based on the study, this may be due to the fact that the cacao

briquettes have had an incorrect product positioning. The cacao briquettes have been positioned as a specialty product and priced at a level considered expensive by the market. The product was positioned in a way that the consumers would purchase it for its unique qualities and good packaging. However, according to the study, all three segments did not give as much value to the appearance, and gave more importance to the price of the product rather than the unique qualities. The study also showed that though the respondents may have liked these unique characteristics, these qualities did not imply that they would purchase the product. In line with this, the study showed that the cacao charcoal briquettes are perceived as a convenience good and should be positioned as such.

Given this, it shows that the reason the product was not able to take off in previous years, apart from the reason there were no stable supply of inputs, was that the positioning of the product did not fit the market in which the foundation would compete. The product was positioned differently than the market perceived it; therefore, there was no market fit. The perception of the foundation with regard to the product was not the same as the perception of the market; therefore, the message of the product was not able to fully come across to consumers.

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Halal Broiler Processing: The Case of Bounty Agro-Ventures Inc. and the Vitarich Corporation

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ABSTRACT

The study aimed to present an overview of the implementation of Halal practices in the broiler operation of Bounty Agro Ventures, Inc. (BAVI) and the VITARICH Corporation (VITARICH) in Davao City. Furthermore, it was conducted to increase the awareness of consumers, producers, processors and distributors on the concept of Halal and its benefits when applied in the broiler industry. This paper used descriptive research design with a series of key informant interviews conducted with the personnel from BAVI and VITARICH on their Halal broiler production and processing practices. The results showed that the broiler processing operations of the two integrators are Halal-certified by Islamic Dawa'h Council of the Philippines (IDCP) and Mindanao Halal Authority (MINHA), and are following the Halal practices specified by the Halal certifiers. However, the broiler production operations of BAVI and VITARICH are not certified Halal but, to maintain Halal integrity of the broilers, they do not feed the animals porcine meals or feeds with pork ingredients. The lack of a unified Halal certifying body and Halal practices, and the questionable Halal credibility of broiler chicken pose the biggest concern for the Halal broiler processing industry. The limited availability, higher price and possible sources of contamination of Halal feeds were critical issues for the industry along with the limited infrastructure/facilities for Halal broiler slaughtering. It was recommended that a unification of Halal certifying organizations and standards and proper support infrastructure be established and made a priority.

Keywords: broiler, Halal, Halal standards, integrator, supply chain
JEL Classifications: Q13, Q17

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I. Introduction

The Muslim population in the world is expected to increase by 26.4% from 2014 to 2030, and it has a positive implication for the global *Halal* industry (State of the Global Islamic Economy, 2014-2015). The industry includes the growth of *Halal* foods, Islamic financing, modest fashion, family friendly travel experience and other services which consider religious practices and gender interaction. In the Philippines, Muslim Filipinos only account for a small percentage of the total population of the country and a majority of them reside in the southern region, yet the *Halal* industry is starting to gain popularity. There is a growing awareness and demand for *Halal* products and services for both Muslims and non-Muslim populations. Muslims prefer *Halal* products because of their increasing awareness of their religious obligations while the non-Muslims shift to *Halal* products as they are known for their safety, hygiene, and ethical quality, thus contributing to growth in the global *Halal* food market.

Currently, the *Halal* industry in the country, particularly on Mindanao Island, strives to flourish as there is a considerable gap between demand and supply in the market. As mentioned, Muslims are expected to consume only *Halal* products, but they cannot do so because a majority of the products available in the local market are non-*Halal*. There are a few available *Halal* products, but the consumers still doubt their credibility as such due to the processes that they underwent that may render the finished products *Haram*, or unlawful (Zulfakar, Anuar, & Talib, 2013).

After recognizing the potential contribution of Halal industries to national economic development, specifically on exports, Republic Act No. 10817 (R.A. 10817), also known as the Philippine Halal Export Development and Promotion Act of 2016, was approved by then President Benigno S. Aquino III on May 16, 2016. This act shall promote the growth and ensure the integrity and quality of Philippine Halal exports and protect consumers and users of Halal products, processes and services from unscrupulous and unfair agricultural, manufacturing and trade practices (Section 2, R.A. 10817). In addition, a Halal Board was created to formulate, advocate, coordinate, oversee and assess the implementation of the Philippine Halal Export Development and Promotion Program (Section 5a, R.A. 10817).

The country is still at an early stage in developing a Halal system in harmony with international standards. As such, the country experiences some difficulties in penetrating the *Halal* industry because of lack of *Halal* certification on food production. Furthermore, the upcoming ASEAN Economic Community Development will hinder Filipinos in exporting local produce and explore opportunities in ASEAN countries due to their non-compliance with Shari'ah Law in managing their supply chains. Last but least, the absence of studies on the status of the *Halal* industry in the Philippines has kept players in the dark and hampered moves to become *Halal* certified. Hence, this study aimed to benchmark the level of implementation of the *Halal* Supply Chain in the country. In addition, compliance with the identified industry players will also be assessed.

Filipino Muslims consume chicken on a regular basis because, aside from being cheaper than beef and some fish as a source of protein, it is always available in the market. The interest of the local broiler producers to go into *Halal* production had been triggered by the prospects of exporting dressed chickens to countries demanding *Halal* certified products and at the same time, to narrow the gap of the supply with the increasing demand for *Halal* broilers locally. However, the shift to the *Halal* production and processing of broiler chickens will only be successful with the aid of a *Halal* supply chain.

Davao City is being positioned as a *Halal*-friendly hub in the Philippines as supported by the Mindanao Islamic Chamber of Commerce (MICC). Early in 2016, the MICC was pushing for the signing of an executive order to create Davao City's *Halal* Industry Development Council, which aims to improve and strengthen the *Halal* industry of the city.

Three out of the five broiler integrators in Davao city have been issued *Halal* certification by various

Halal certifying organizations in the country. It is noteworthy that these integrators sought *Halal* certification for broiler production in response to the clamor for *Halal* chicken and chicken by-products by the many Muslim consumers who live in- and near the region, and additionally, large processing plants are also present. However, the total volume of *Halal* broilers is still insignificant compared to the total volume of production of non-*Halal* broilers. There are many broiler integrators in the country, but only a few ventures into *Halal* broiler operation because of a limited understanding of the importance and benefits of employing *Halal* practices.

II. Literature Review

The growing awareness of the Muslim Filipinos in the southern Philippines and the influx of tourists from Muslim countries have contributed to the increasing demand for certified chicken products. There is an opportunity for the Philippine poultry industry to take advantage of this as the economic gains far outweigh the expenditures in the compliance standards set forth by the *Halal* poultry market.

Broiler integrators in the Philippines are now catering to the *Halal* market in the country, producing *Halal* certified fresh and frozen dressed chicken as well as chicks for raising. The key players in the poultry industry are San Miguel Pure Foods for Magnolia, Bounty Agro Ventures for Bounty Fresh, Swift Foods for Swift, the VITARICH Corporation for Cook's, Universal Robina Corp. and Foster Foods for Foster (Dy, 2007).

Of the above integrators, only three key industry players were given *Halal* certification by the IDCP, one of the *Halal* certifying NGO in the Philippines. One of them is Bounty Agro Ventures (IDCP, 2011). There are also smaller companies that are in the broiler industry and are *Halal* certified. They are mostly located in Mindanao, particularly in the cities of Davao and General Santos, where a majority of the *Halal* product consumers reside. However, the NCMF accredited only four *Halal* certifying bodies in the country and, unfortunately, the IDCP is not one of them. The *Halal* certification is not only critical in the *Halal* industry in the Philippines but also in emerging ASEAN economic integration.

2.1. Halal Integrity of Products

2.1.1. Halal Supply Chain

The main goal of *Halal* Production Standards, aside from customer satisfaction, is to ensure that the *Halal* status of the food product remains intact throughout the whole process of the supply chain (Cited by Zulfakar et al., 2012 from Bahrudin, Illyas, & Desa, 2011). The product must be *Halal* from the starting point until it reaches its end point in the chain; the possibility of becoming non-*Halal* increases when the product needs to travel a greater distance wherein many of handling points are involved. All parties involved in the *Halal* supply chain should follow all necessary steps of *Halal* standards to maintain the "*Halalness"* of the products throughout the chain (Zulfakar et al., 2012).

2.1.2. Halal Labeling

The problem in labeling products with *Halal* is that, oftentimes, non-Muslims think that *Halal* products are made for the benefit of Muslim consumers only (de Guzman, 2008). The acceptability of *Halal* products to non-Muslims is significant in production and new investment in *Halal* certified products. Another concern in *Halal* labeling is whether the *Halal* labeled product is indeed *Halal* or not at some point in production. In the Philippines, the general guidelines on *Halal* food are indicated in the Philippine National Standard 2067:2008 from the DTI.

With Islam now considered the second largest religion, and the fastest growing, Muslims are soon expected to represent the largest share of global spending. The Muslim population in the world is expected to increase by 26.4% from 2014 to 2030, and this has a positive implication for the global *Halal* industry (State of the Global Islamic Economy, 2014-

2015). It has been reported that *Halal* market is currently worth 16% of the entire global food industry and is expected to rise to 20% in the near future with Asia, Africa and Europe accounting for 63%, 24% and 10%, respectively (Spiegel, Fels-Klerx, Sterrenburg, Ruh, Scholtens-Toma, & Kok, 2012). According to Farouk (2013), the main drivers of *Halal* growth have been: a growing Muslim population, economic growth within the Muslim world, and increased disposable income.

With the rise in the demand for *Halal* food products, producers from non-Muslim countries such as the US, Brazil, and Australia are keen to tap this opportunity (Global *Halal* Food Market 2015-2019). The Philippines, despite its being the only Catholic country in Asia, and with Filipino Muslims accounting for about 5% in the 2000 and 2011 census and 11% in a 2012 report by the NCMF, could strategically position itself in the global *Halal* market.

Overall, there is a growing awareness and demand for *Halal* products and services for both Muslims and non-Muslim populations. While Muslims prefer *Halal* products because of their increasing awareness of their religious obligations, non-Muslims shift to *Halal* products for their safety, hygiene, and ethical quality, thus contributing to growth in the global *Halal* food market.

2.1.3. Poultry Production

Contract growing ventures are beneficial to integrators in increasing production efficiency, accelerating technology transfers, improving quality, and linking small farms to large markets (Digal, 2007). Not only can the integrators control the quality of broilers in contract growing but also are able to minimize the risks in production. The risks in market and production failures are concentrated in contract farms; thus, the integrators are less prone to losses by not being responsible for production.

There is no existing literature on *Halal* practices in broiler processing in the Philippines. There are *Halal* standards from various *Halal* certifying organization, but they are rather generic on *Halal* foods and not on *Halal* broiler processing. Thus, it is imperative to conduct this study to gain insights into *Halal* practices in broiler processing in the Philippines, especially in Davao City.

III. Data and Methodology

3.1. Data Collection

The research used primary data which were provided by identified broiler processing companies and broiler consumers from Davao City. The respondents from broiler integrators were identified and interviewed using the snow-ball technique. Broiler processors operated by non-Muslim managers were identified with the help of NMIS Region XI, while those operated by Muslim managers were recommended by the Muslim community in Davao City.

Primary data regarding the profile and activities of broiler processors were obtained through a key informant. There were two representatives from VITARICH and one from BAVI. Moreover, the researcher was able to interview two representatives from the processing plant hired by BAVI and one quality assurance specialist from the VITARICH dressing plant.

Also, a survey was conducted to assess the current market demand for *Halal* broiler in the city. Since there was no list of broiler consumers in Davao City, the researcher identified and interviewed 60 broiler consumers using purposive sampling.

Ideas on how broiler processors perform the *Halal* practices during their operations were obtained through key informant interviews among the broiler integrators in Davao City. The researcher gathered data regarding the processors' profile and their broiler operations (e.g. location of processing plant, years of experience in broiler processing, years of *Halal* operation, sources of inputs and processing capacity). In addition, well-known *Halal* feed (EMACC Feeds) and *Halal* broiler producers (K-Star Poultry) in the area that are operated by Muslims were also interviewed to gain insights into

Halal practices as managed by Muslims. It also helped in the analysis of the operation of *Halal* broiler processors in Davao City.

Personal observation on the operations of *Halal* broiler processors was made to be able to identify problems, issues and opportunities in *Halal* broiler processing.

The research also used secondary data from published and unpublished journals, and government agencies. The data on the demand for *Halal* broilers of the international market was sourced from published articles online. Moreover, data on the volume of production of dressed chicken in the city were obtained from NMIS Region XI. The PNS for *Halal* Food was used to compare the actual *Halal* practices of broiler integrators and the right *Halal* practices.

3.2. Data Analysis

Descriptive statistics were used to present the profile of broiler processors in Davao City. The result helped in the assessment of the structure of the *Halal* broiler supply chain in Davao City and in describing the activities performed by the industry players. Also, the Porter's Five-Forces Model of Competition was used to assess the broiler processing industry of Davao City and to recommend development and investment entry points for the government and possible industry players.

The performance of the *Halal* broiler integrators in Davao City was evaluated by looking into the factors enhancing *Halal* food supply chain integrity such as *Halal* certification, *Halal* standards, *Halal* traceability, *Halal* dedicated assets, trust among supply chain members, commitment of supply chain members, and the role of government.

IV. Results and Discussion

4.1. Overview of the Overall Broiler Industry in Davao City

The Davao Region was one of the top producers of broilers in the Philippines in 2014 (PSA, 2014) with 83% of the inventory coming from Davao City (National Meat Inspection System, Regional Office No. 11). There are five broiler integrators in Davao City that contribute to the broiler supply of the area, three of which are *Halal* certified, one is non-*Halal* and one is not known.

In general, these broiler integrators have toll partners to execute activities in broiler operation, but they still have control over their constituents through the implementation of quality standards at all levels of operation. Table 1 shows the broiler integrators operating in Davao City, their average volume of production of dressed chicken and status of *Halal* certification. It shows that San Miguel Foods Inc. (SMFI) is the top producer of dressed chicken, followed by VITARICH, Ana's Breeders (AB) and BAVI in decreasing order.

Table 1. Average Volume of Dressed Chicken Produced by Broiler Integrators in Davao City and *Halal* Certification Status: 2015

Broiler Integrator	Average Monthly Volume of Dressed Chicken Produced (kg) in 2015	Halal or Not Halal	Halal Certifier
Ana's Breeders	507,312.76	Not Halal	n/a
Bounty Agro Ventures Inc.	300,644.29	Halal	Islamic Dawa'h Council of the Philippines
San Miguel Foods Inc.	1,272,087.56	Halal	Islamic Dawa'h Council of the Philippines
VITARICH Corporation	813,190.41	Halal	Mindanao Halal Authority
Smartbucks	-no data	-no data	-no data
Total	*2,893,235.02		

Notes: 1. n/a= not applicable.

2. Total monthly volume recorded by NMIS ROXI (not necessarily the whole industry).

Source: NMIS Region XI (2016).

Currently, processing of dressed chicken by BAVI and SMFI are *Halal* certified by IDCP while VITARICH is certified by MINHA, a duly accredited certifier of the NCMF. AB's operation is not *Halal*-certified. Among the three *Halal* certified integrators, the latest to be certified was VITARICH in 2014.

4.1.1. Halal Broiler Integrators in Davao City

Among the five broiler integrators in Davao City, only the BAVI and VITARICH management allowed the conducting of interviews with their company. Both integrators are actually just one of the branches of their respective companies that are operating throughout the country. These branches in Davao City were established to provide more focus on the market they cater to. The combined production outputs of these integrators represent at least 38% of total industry production.

4.1.2. Case of Bounty Agro Ventures Inc.

BAVI. has been operating in Davao City for 13 years, but was given *Halal* certification in 2011 only. Their office is located at Bago Aplaya, Davao City, which is separate from its production and processing plant.

BAVI has been *Halal* certified for only four years even though it has been operating in the area for 13 years. The quality management systems used by BAVI in their operations include the GMP, *Halal* Practices and BAVI's quality standard. BAVI's strategy includes forward integration wherein they have control over the retailing of their product through Chook's-to-go outlets within in the city. However, they do not own their own production farm, so they hire contract growers and pay them per number of live chickens. Contract growing minimizes the risk that BAVI will bear during production like threats of avian diseases and weather conditions that can affect the health of the broilers.

In addition to contract growers, BAVI also hires a dressing plant for processing, truckers for delivery and transportation and distributors for broiler distribution in different areas in the region and nearby provinces. BAVI, at present, has 17 contract growers within Davao City and only one dressing plant, the Red Rooster Agro-Industrial Ventures Inc (RRAIV). Their current buyers include S & R in Davao, NCCC Supermarket, and other supermarkets and distributors that were not named during the interview.

BAVI was certified *Halal* by the IDCP which cost the company Php300, 000 for certification. Other than the fee for certification, a representative from IDCP should be present every time the dressing plant will operate, and BAVI is the one to compensate the person.

4.1.3. Halal Production Practices of BAVI

BAVI produces *Halal*-certified dressed broiler chicken purposely to cater to the need for *Halal* food products of Muslim consumers in Mindanao. To ensure the *Halal* integrity of their dressed chicken, they implement the observation of *Halal* practices at all level of broiler operations. Since both integrators do not have their own farms for broiler production, the strict observance of *Halal* practices is extended to their contract growers, who are their toll partners. Table 2 shows the summary of requirements in *Halal* broiler production for BAVI.

In the case of BAVI, the company provides day-old chicks, feeds, vaccines, disinfectants and all other technical assistance to contract growers for broiler production. The contract growers, on the other hand, provide the housing facilities, equipment, manpower, and utilities. To ensure that the broiler grown is *Halal*, BAVI provides feeds that do not contain pork ingredients, which are considered unlawful under Islamic laws. The company does not buy feeds that are commercially available; rather, they do in-house

formulation using raw materials they outsourced. However, they do not have specific considerations when it comes to the use of vaccines. In the interview with the company veterinarian, they are still using the same vaccines and other medicines that they have been using even before becoming *Halal* certified.

Table 2. Summary of *Halal* Broiler Production for BAVI

	BAVI
Broiler Producer	Contract Growers
Inputs provided by the integrators	Day-Old chicks Feeds Vaccines Disinfectants
Inputs provided by the Contract Growers	Housing Facility Equipment Labor Utility
Source of feeds	In-house formulation
Consideration in feed formulation	*Halal* raw materials
Consideration in Antibiotic/ Vitamins/ Vaccines	None
Type of Housing Facility	Tunnel- Ventilated Conventional Type
Standard Live Weight (kg)	1.44- 1.55
Growing cycle (days)	28-32
Minimum Number of Broilers per Farm (Heads)	10,000
Agricultural animal grown in the Farm	Broiler Chicken

During production, the BAVI veterinarian visits the farms to assist in the vaccination of the birds and to monitor the farm management of contract growers. The company's standard live weight is 1.44-1.50 kg at harvest, which usually takes about 28-32 days, depending on the management skills of the contract growers.

In order to be a contract grower for BAVI, the company requires that the farm or the contract grower produce at least 10,000 heads per growing cycle. Also, BAVI requires that all chickens must be harvested before starting another growing cycle to ensure the biosecurity of broilers.

4.1.4. Halal Processing Practices of BAVI

In the production of *Halal* dressed chicken, it is also important that the broilers are dressed and processed in a *Halal* way. BAVI leases a dressing plant for which they applied to have *Halal* certification from IDCP.

BAVI has Red Rooster Agro-Industrial Ventures (RRAIV) as its toll dressing plant, located in Northern Binugao, Toril Davao City. The dressing plant is owned by the RRAIV under its mother company, the Snapsnacks Corporation. It has been the toll dressing plant of BAVI for 13 years, with whom they renew their contract every three years. Table 3 shows the summary of the profile of BAVI's dressing plant.

RRAIV got their certificates as GMP compliant and meeting *Halal* standards for food processing. The dressing plant is generally operating from Mondays to Saturdays, and they are able to process 18,000 to 20,000 live birds from 8 AM to 5 PM. There are times, however, that they cannot operate because contract growers failed to harvest and send live birds to the plant for processing.

BAVI almost has the same activities involved in the processing of broiler chicken with other integrators

except that a portion of dressed chicken from BAVI undergoes a value-adding processing before dispatching. They require strict compliance of GMP and *Halal* practices at all levels of operation. It is required that animals should be treated as humanely as possible, so RRAIV allows the birds to rest for a period of 30 minutes to an hour before they will be slaughtered.

Table 3. Summary Profile of BAVI's Dressing Plant

	BAVI
Toll Dressing Plant	Red Rooster Agro-Industrial Ventures (RRAIV)
Location of Dressing Plant	Northern Binugao, Toril, Davao City
Years of Toll Partnership	13
Form of Ownership	Corporation
Type of Processing Plant	Owned "AA" Accredited
Quality Management System	GMP *Halal* Practices BAVI Quality Standards
Minimum Number of Birds Processed per Day	7,000
Operating Days per week	6
Average processing time per batch	2-3 hours

The initial processes in BAVI's *Halal* broiler processing involve the receiving of live birds, which include the following activities: unloading of the birds in their crates, counting of birds per crate, ocular inspection, weighing the live birds and hanging them in the carousel, preparing for the processing of dressed chicken. The birds that died during transport or upon arrival at the plant are collected and buried to avoid contaminations.

Before slaughtering, stunning is done to render the animals dazed to avoid wild movements of animals during slaughter. However, it is of utmost importance that the animals are alive even after stunning to make the resultant product *Halal*. *Halal* certifier require that the neck slitter of the dressing plant is a practicing Muslim with broad knowledge and understanding of the *Halal* practices and proper slitting of animals in accordance to Islamic Law.

The act of *Halal* slaughtering begins with the recitation of the phrase "Bismillah Allahu-Akbar" while the neck is cut from ear to ear. Also, the incision made during the slaughtering must sever the esophagus, trachea, carotid arteries and jugular veins to cause immediate and massive hemorrhage. The slitters are only allowed to use a very sharp knife so that the slaughtering will be successful with a single stroke and avoid causing some degree of suffering due to the pain caused by multiple slitting. After slitting, the birds are allowed to bleed to remove the blood prior to dressing procedures. If not done properly, the dressed chicken will have bruises caused by blood clotting and will be classified under low quality and will be considered *Haram*, or not *Halal*.

After bleeding, the slaughtered chicken goes through a machine that does the scalding, de-feathering and washing yielding a featherless whole chicken. The head will then be removed along the line to be followed by the process of evisceration wherein the visceral organs of the chicken are removed. The next step is the carcass washing followed by hock cutting or the removal of the chicken feet. Strong compliance with GMP and *Halal* practices is observed not only by employees but also in the use of machineries and equipment. Final carcass inspection is conducted by a representative from NMIS Region XI before transferring the dressed chicken to the chilling area to determine that diseases in the internal organs and muscles do not exist and finally cleared for processing to consumption.

Pre-chilling is a process involving the soaking of the chicken carcass in water filled with ice and a

chlorine concentration to prevent microbial growth. The water temperature is 17˚C-20˚C while the chlorine concentration is 50-100 ppm. In the final chilling the water temperature is ≤ 2˚C, the carcass temperature is ≤4˚C and the chlorine concentration is 50-100 ppm. After chilling, the dressed chicken or carcass is ready for packing either in a crate or in cellophane.

After final chilling, 30% of the dressed chicken is ready for storage and dispatching, and the remaining 70% undergo further value-adding processes, like margination, and distributed to chooks-to-go outlets as roasted chicken. Bounty distributes their fresh chicken product both in local groceries and wet markets.

4.1.5. Case of VITARICH Corporation

VITARICH Corporation has been operating in Davao City for 19 years. They have a breeder farm, feed mill and dressing plant in Davao City which were all *Halal*-certified by the Mindanao *Halal* Authority in October 2015. The *Halal* certification process under MINHA costs Php51,000 a year and the annual renewal of the certificate is required.

The quality management systems used by the company to ensure the quality of their broilers include the following: GMP, Hazard Analysis and Critical Control Point (HACCP), ISO, *Halal* Standards and VITARICH Quality Standard. Buyers of dressed chicken from VITARICH are SM Bonus, Mang Inasal, KCC and other unnamed supermarkets and distributors inside and outside the Davao Region. The current dressing plant is under the management of Heroes Agri-Venture.

4.1.6. Halal Production Practices of VITARICH

In order to maintain the *Halal* integrity of dressed chicken produced by VITRICH, strict observance of *Halal* standards by all members of the supply chain of the company is required. However, the numerous contract growers hired by the company caused restrictions in the monitoring of *Halal* practices in the operation. Table 4 shows the summary of requirements in the production *Halal* broilers for VITARICH.

Table 4. Summary of Requirements in *Halal* Broiler Production for VITARICH

	VITARICH
Broiler Producer	Contract Growers
Inputs provided by the integrators	Day-old chicks Feeds Vitamins
Inputs provided by the Contract Growers	Housing Facility Equipment Labor Utility
Source of feeds	VITARICH Feeds
Consideration in feed formulation	*Halal* raw materials
Consideration in Antibiotic/ Vitamins/ Vaccines	Plant-based/ *Halal*
Type of Housing Facility	Tunnel- Ventilated Conventional Type
Standard Live Weight (kg)	1.45
Growing cycle (days)	28-30
Minimum Number of Broilers per Farm (Heads)	--
Agricultural animal grown in the Farm	Broiler Chicken

Note: --data not provided.

The VITARICH Corporation provides contract growers necessary inputs and technical assistance to ensure *Halal* practices are properly executed in broiler production. In addition to these inputs, broiler produc-

tion requires buildings/ housing facilities, equipment, manpower and utilities, which are counterparts of contract growers.

Feeds provided by the company do not contain pork or pork-related ingredient and bone meal that are considered *Haram*. Before *Halal* certification, VITARICH was producing livestock and poultry feeds with porcine ingredients, which is *Haram*, but they are relatively cheap. When they decided to shift to the production of *Halal* feeds, the company began using fishmeal and bones, which are costlier than porcine derivatives.

The average live weight of broiler chicken required by VITARICH from its contract growers is 1.45 kg. The contract growers will usually take 28-30 days to attain this average weight. VITARICH requires the contract growers to observe at least a 15 day rest period between growing cycles for cleaning and sanitation of broiler farms.

VITARICH has truckers as toll partners to deliver harvested broilers to the dressing plants. The company requires that the vehicles used in the transport of live chicken are used exclusively for the purpose of *Halal* dressed chicken.

4.1.7. Halal Processing Practices of VITARICH

In the production of *Halal* dressed chicken, it is also important that the broilers are dressed and processed in a *Halal* way. VITARICH owned a dressing plant, but they hired Heroes Agri-Venture (HAV) to manage the facility. *Halal* standards set by MINHA are implemented by the company to ensure that the *Halal* integrity of their broilers is maintained throughout the operation. The dressing plant is accredited by the NMIS Region XI as an "AA" dressing facility, or a combination of manual and mechanical operations. Table 5 shows the summary profile of the toll dressing plant of VITARICH.

Table 5. Profile of Dressing Plant of VITARICH

	VITARICH Corporation
Toll Dressing Plant	Heroes Agri Venture
Location of Dressing Plant	Quarry, Tugbok, Davao City
Years of Toll Partnership	19
Form of Ownership	Sole Proprietorship
Type of Processing Plant	Rented "AA" Accredited
Quality Management System	GMP HACCP ISO *Halal* Practices VITARICH Quality Standards
Minimum Number of Birds Processed per Day	20,000
Operating Days per week	6
Average processing time per batch	2-3 hours

The HAV's operation is HACCP accredited; it is GMP, SSOP and *Halal* certified. The operator begins the implementation of quality management systems, specifically the *Halal* practices, upon the receipt of live broilers.

The first activity in broiler processing is the receiving of broilers from contract growers. All chickens are unloaded from the delivery trucks, then weighed. The dead and unhealthy birds are separated, and they are not used for processing since it can cause contamination and might cause harmful effects to consumers. After weighing, the dressing plant allows the birds to rest for 30 minutes to one hour before hanging for slaughtering. Once the animals are

hanging by their feet, the revolving belt will bring the birds in contact with the stunning equipment. The processors make sure that the birds are still alive even after stunning and before slaughtering. VITARICH hired slitters that are approved by the Mindanao *Halal* Authority, and these qualified slitters were assessed regarding their knowledge on Muslim slaughtering and Islam. The slitting in accordance to *Halal* standards requires that a sharp knife be used to cut through the skin, trachea, esophagus and two major blood vessels to ensure thorough and quick bleeding of the bird. The qualified slitter recites "Bismillah-Allahuakbar" to dedicate the act of slaughtering to Allah.

After slitting, the birds are allowed to completely bleed before being subjected to scalding. No blood should be left inside the body of the chicken since blood is *Haram* and it may cause contamination and bad effects to consumers. Scalding and de-feathering follow the bleeding process, wherein the birds pass through a machine that perfroms the processes. The temperature of scalding water is 58-60˚C.

The process of evisceration is followed by final carcass inspection. The whole dressed chicken are then forwarded to a chilling area where the carcasses are soaked in a water bath with a temperature of 32-36˚F for 45 minutes to one hour.

The dressed chicken is classified and graded depending on the quality of the carcass. The dressed chicken proceeds to packing or leg banding depending on the buyers' requirements, and are then weighed for labeling. After weighing the packed dressed chicken, ice will be placed on the crate with the products inside and will be then transferred to the holding room with a temperature of 32-39˚F. Other carcasses, after icing, undergo blast freezing (-30 to -40˚C) and are then later stored in a room at temperatures of -15 to -18˚C.

The dressed chicken is dispatched after holding and/or storing. Some of the dressed chickens are delivered to buyers, but there are also some customers that get orders directly from the dressing plant.

HAV under VITARICH strictly adheres to the *Halal* standards set by MinHa in *Halal* broiler processing. According to the quality assurance specialist of the VITARICH Corporation, there were only small changes in operations from non-*Halal* to *Halal* operation, and a majority of it happened during slaughtering. The rest of the processes after slaughtering are the same since the company was already observing GMP to avoid food contamination.

4.1.8. Transportation of Halal Dressed Chicken- BAVI and VITARICH

In order to maintain the *Halal* integrity of dressed chicken, BAVI and VITARICH require delivery trucks provided by toll partners be used for *Halal* broiler products only. No non-*Halal* product may be loaded in the same truck at the same time as *Halal* broiler products, or at any other time, to avoid contamination and preserve the *Halal* integrity of *Halal* products.

Halal transportation is not limited to final products but also to the inputs used in the production of *Halal* foods. Broiler integrators such as BAVI and VITARICH avail transporting services to ease themselves of the burden of raw material and finished product delivery. Also, it is advantageous for broiler integrators to hire truckers so they will not need to invest in such facilities. However, dressed chickens are more prone to *Haram* contamination since the truck for *Halal* broilers may have been used for animals or produce that are not *Halal*.

In the case of *Halal* broiler production, broiler integrators see to it that raw materials for feed formulation are transported in a *Halal* way. Thus, it is important to have *Halal* dedicated assets to ensure the *Halal* integrity of the product until it reaches its final consumer.

4.1.9. Halal Broiler Supply Chain of BAVI and VITARICH

Figure 1 shows the activities of BAVI and VITARICH as broiler integrators. Both integrators hire contract growers to produce the broiler chicken, and as the integrator, they provide necessary raw materials for broiler production. The contract growers have to wait at least 30 days after harvesting all the broilers to receive the payment of the broiler integrator.

The broilers produced are used as an input in the *Halal* broiler processing of both integrators. In the case of BAVI, some of the dressed chickens are used as inputs for Chooks to Go while the others go to distributors and institutional buyers. The dressed chickens from the dressing plant of VITARICH go to distributors and institutional buyers.

Distributors of BAVI and VITARICH products use cash or issue checks as the mode of payment. Institutional buyers, on the other hand, have credit agreements with the integrators. Some distributors of VITARICH supply other institutional buyers, and there are also those who supply retailers. These retailers are usually in the wet market. The usual agreement between the two involves the retailer getting the dressed chicken in the morning and paying the distributor at the end of the day.

BAVI's distributors supply all produce to retailers, and the mode of payment is cash. However, retailers also outsource supply from institutional buyers, which also prefer cash payments.

The final consumers obtain dressed chicken from institutional buyers, like grocery stores and restaurants, and from retailers in a wet market and neighboring *talipapa*. Consumers can pay either in cash or credit since credit cards are accepted in supermarkets but not wet market and the *talipapa*.

4.2. Current Market of Halal Broilers in Local and Global Trade

4.2.1. Profile of Broiler Consumers in Davao City

The survey conducted was to determine if there is a demand for *Halal* certified broiler in the local market. Most of the respondents (33.33%) have an average annual income between Php50, 000-100,000, with the rest having different average annual incomes. The respondents are from different religious groups: 33.3% are Muslims; 43.3% are Catholics; and 23.3% are Christians. Even though *Halal* broilers are in the context of Islam, other religious groups are still consuming *Halal* broilers as part of their religious beliefs.

Based on the survey conducted to determine the demand for *Halal* broilers in Davao City, 73.33% (44 out of 60) of the respondents are already consuming *Halal* certified broiler products, and 90.91% (40 out of 44) of them require that the broilers have *Halal* certification. Meanwhile, 94.4% of those that do not consume *Halal* chicken said that they wanted to consume *Halal* certified products as well, but cannot do so because of unavailability in the store where they buy chicken products.

The most common reason of the respondents as to why they prefer *Halal* broiler is because it is safe for human consumption (52 out of 60). Moreover, 26 respondents (43.33%) consume *Halal* broilers for religious purposes, like the Muslims and Adventists, and 83.33% (50 out of 60) respondents also believed that *Halal* broilers are clean to consume. One respondent's reason was the availability of *Halal* broilers in the local market.

On average, the respondents consume 2.3 kg of broiler meat in a week, and their most preferred brand (30% or 18 out of 60) is Bounty Fresh. The average price that the respondents pay for a kg of chicken meat is Php140.70. Also, the result of the survey showed that respondents are willing to pay a 3-30% mark-up per kg of *Halal* certified broiler products, or 12% on average. In 2015, the average retail price of dressed broiler chicken in Davao City was Php132.53 (PSA), and if the respondents are willing to pay a 12% mark-up for *Halal* dressed chicken per kg, then a kg of dressed *Halal* broiler chicken may be priced on average at Php148.43.

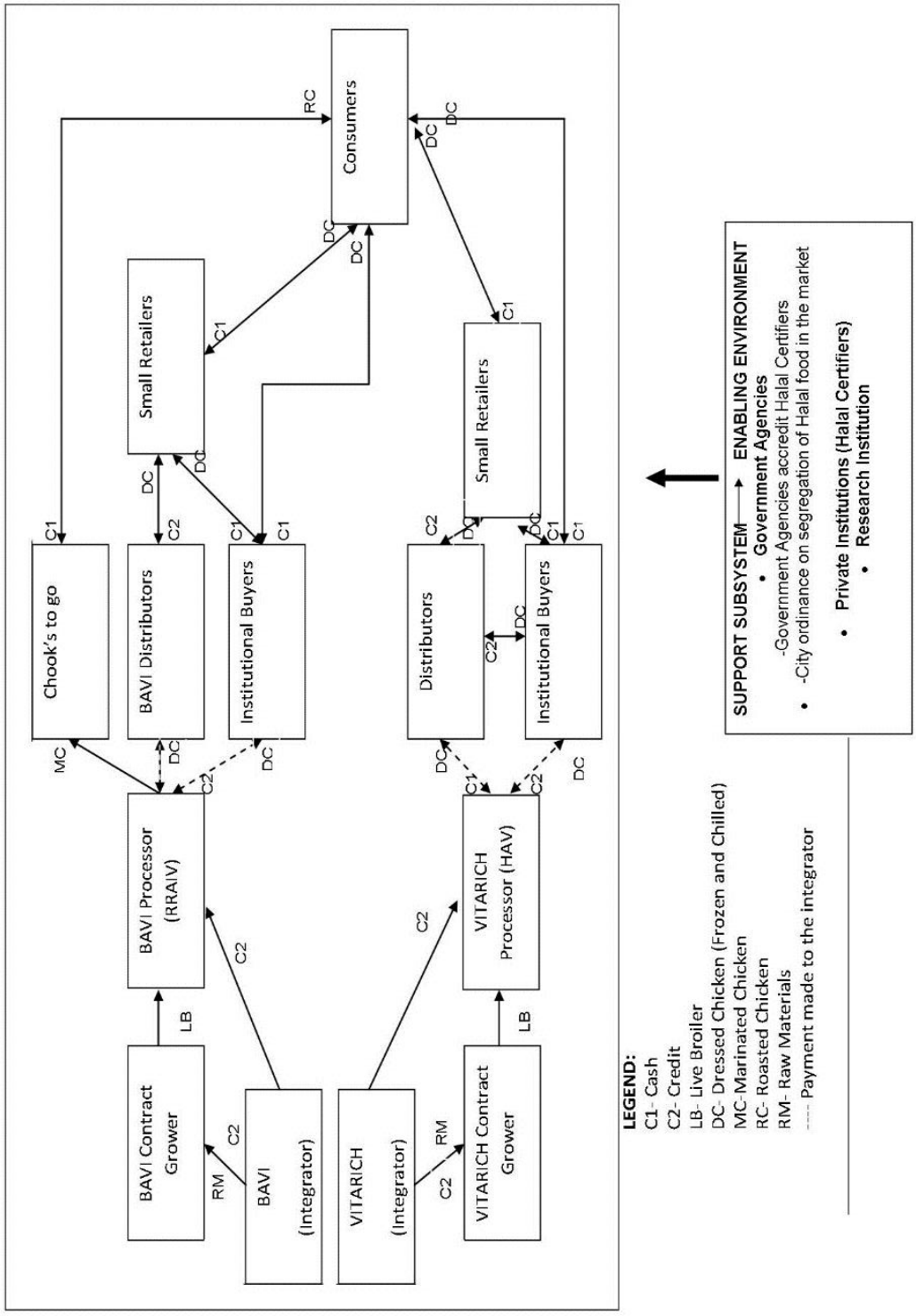

Fig. 1. Halal Broiler Supply Chain, Enabling Environment and Support Subsystem

Projected Price per Kg of Halal broiler chicken (dressed)
= Ave.retail price of dressed broiler chicken+12% mark-up
= 132.53+(0.12x132.53)
= Php148.43

where Average retail price of dressed broiler chicken in Davao City is Php132.53.

On the other hand, the price per kg of dressed *Halal* broiler chicken based on the average price that the respondents are paying for a kg of dressed chicken is Php157.58.

Projected Price per kg of Halal broiler chicken (dressed)
= Ave.payment for a kg of dressed chicken+12% mark-up
= 140.70+(0.12x140.70)
= Php157.58

where the average price of the respondents for a kg of dressed chicken is Php140.70.

The estimated annual demand for *Halal* chicken in the Philippines was 23,408,798.83 kg in 2010. The value was computed by multiplying the Muslim population in the 10 Philippine provinces with the largest Muslim population in 2010 and the average annual per capita consumption of chicken in Regions IX, XI, XII and ARMM (Muslim dominated regions).

Estimated annual demand for halal chicken = 5.21 kg × 4,493,130
= 23,408,798.83 kg per year

4.2.2. Demand for Halal Broiler in the International Market

According to Gulfood 2016, as cited from Global *Halal* Food Market 2015-2019, the current estimated global *Halal* market value for trade in food products is US$547 billion a year, and it is expected to reach $1.6 trillion in 2018. The increasing demand for *Halal* food may be attributed to the growing awareness of Muslim consumers worldwide on religious obligations. The Muslim population is continuously growing, and so is the demand for *Halal* products and services.

Being a Muslim dominated country, Malaysia's primary source of protein is chicken meat because it is relatively cheaper compared to beef. The per capita consumption of chicken meat in Malaysia is over 40 kg per year, which is among the highest in the world. As shown in Table 9, the total domestic consumption of *Halal* poultry, mostly broiler meat in Malaysia, increased by 3% in 2013 and 2% in 2014. Domestic production of *Halal* poultry increased by 2% in 2013 and was expected to increase by another 2% in 2014 (from 1.4 million tons in 2013 to 1.43 million tons in 2014) together with imported *Halal* poultry products as a response to the increase in domestic consumption. The leading exporter of poultry meat to Malaysia is China.

The volume of imported poultry products covers only a small percentage of domestic consumption since the country has very strict requirements in all food products entering the country. All imported poultry meat is tightly controlled and limited.

On the other hand, the UAE's poultry sector was increasing in 2013 to 2014, and was expected to continuously grow in 2015 and 2016 with chicken production dominating. The domestic production of poultry meat in the UAE is expected to be 45,000 metric tons in 2015 and 46,000 metric tons in 2016, 5% and 2% higher than the previous years. Eighty-five percent (85%) of the total market demand of poultry meat in UAE is supplied by imported poultry meats, mainly from Brazil. Consumption, or domestic demand, is expected to modestly increase in 2015 and 2016 by 1-2 percent, (385,000 MT and 391,000 MT consecutively).

The UAE government requires that the poultry meat produced locally and imported is slaughtered according to Islamic requirements, or they must be *Halal*. The UAE, in contrast to Malaysia, requires that all imported poultry products must have a *Halal* certificate issued by an approved U.S. Islamic Center, thus allowing the entry of poultry products from the U.S.A.

V. Identified Problems, Issues and Opportunities in the *Halal* Broiler Processing in Davao City

5.1. Lack of Unified Halal Certifying Body and Halal practices

In the Philippines, there are at least four *Halal* certifying organizations involved in certifying food, food products, services and establishments. These four organizations have different requirements for *Halal* certification (different fees and procedures). Since most integrators are led by non-Muslims, there is confusion as to where they should apply for *Halal* certification. For instance, the IDCP (*Halal* certifier of BAVI and SMFI in Davao City) is not accredited by the NCMF, the government agency mandated to protect the welfare and rights of the Muslim Filipinos. However, foreign exporters require that *Halal* certification must come from the IDCP as their *Halal* requirements are the same as the Malaysian *Halal* standard, which is recognized by foreign traders.

5.2. Questionable Halal Credibility for Broiler Chicken

For processors to process *Halal* chicken, the supply of live birds should also be *Halal*. However, BAVI and VITARICH contract growers do not have *Halal* certification, and the activities in production are based on the standards provided as an integrator. Monitoring the implementation of these integrators' standards is not properly done nor implemented. The issue of *Halal* integrity of live chicken produced by contract growers renders the integrity of dressed chicken produced by *Halal* processors questionable.

5.3. Limited Availability of Halal feeds and Possible Sources of Contamination

The broiler integrators in Davao City are formulating and producing their own feed; however, small scale producers are highly dependent on available commercial feed in the city. For broiler producers who are in *Halal* broiler production, the availability of *Halal* feed in the market is a constraint in their operations. There is only one *Halal* feed producer in the city, the EMACC *Halal* Feed Producer, whose capacity of production is still small.

The supply shortage of *Halal* feed is also confronted with the problem of the high cost of raw materials that are used to substitute for the porcine and porcine derivatives. For instance, fish meal, soy meal and other plant derived materials prove to be costlier than porcine and porcine derivatives, which the feed millers have to purchase as their raw materials in *Halal* feed formulation.

The owner of EMACC *Halal* feed in Davao City said that the primary source of protein for their feed is soybeans, which is not available in the Philippines. So, the company has been importing soybeans as an ingredient for the feed. The importation cost added to the production cost of *Halal* feeds makes it more expensive than non- *Halal* feeds from the market that uses other protein sources, such as blood meal, which is *Haram*.

5.4. Limited Infrastructure/Facilities for Halal Broiler Slaughtering

Halal broiler integrators in Davao City have their own *Halal* certified dressing facilities, and there are small-scale *Halal* broiler producers that lack the capital or raw materials to sustain operations. The slaughter house in Davao City is used for slaughtering livestock and poultry animals, and because of its non- *Halal* operations, processing of *Halal* broilers in the facilities will render the product non- *Halal*. Provisions for *Halal* products in the city are very limited, as it can be observed in the wet and dry market where goods are stored together in one area, whether *Halal* or not; thus, contamination happens.

VI. Recommendations

6.1. Possible Development Entry Points

6.1.1. Unification of Halal Certifying Organization and Standards

The NCMF has accredited three *Halal* certifying organizations in the country at present following the PNS on *Halal* food. However, certifications being issued by these certifiers are not recognized in the export market. With the ASEAN integration, new markets will open for Filipinos to sell products in. Free trade among and between countries may provide opportunities for Filipinos to market products; however, competition will be at its highest. In order to take advantage of the opportunities of the growing global *Halal* industry and ASEAN integration, the Philippine government should harmonize efforts to create multi-agency collaborations to assist the NCMF in strengthening its accreditation program for the certifying bodies of *Halal* products and services. Said certifying bodies must be able to establish credibility to function as such in order to be recognized by the neighboring countries and communities through the world as *Halal* certifiers.

With the approval of Republic Act 10817, also known as the Philippine Halal Export Development and Promotion Act of 2016, the Halal system of the country is expected to have a unified standard among certifying bodies in harmony with the international Halal standard. In addition, this act shall help in the development of the Halal industry of the country and create awareness among the possible industry players.

6.1.2. Providing Market Information

The processors' knowledge of the market is significant in deciding what product to produce and how much to produce. This will be possible if market information such as price, supply and demand situations within and outside the area is readily available. The market demand will tell the processor what the market needs and how much to process. Moreover, the current supply of the product in the market will tell the processor if the market is in need of supply or if the market is already oversaturated. Lastly, price information will give the processor an idea if there is an incentive to enter the market.

A report from the DTI on the status of *Halal* products in the market is beneficial. This is somehow related to the creation of a single *Halal* governing body in the country that should be created to, as part of its objectives, gather and interpret data regarding the Philippine *Halal* industry that will be useful in improving the market.

6.1.3. Infrastructure Development

There was a proposal to build a *Halal* slaughter-house in the city; however, to this date, it has not still materialized. It is highly recommended that the government allot a budget for *Halal* infrastructure development and start construction immediately. This will facilitate the slaughtering of *Halal* broilers produced by small-scale farmers, especially those non-Muslims who wish to produce *Halal* broiler meat. These *Halal* facilities will also accommodate the slaughtering of other *Halal* animals such as carabao, cow and goat. Since the city is pushing to become the *Halal* hub of the country, this development is essential in the development of the *Halal* industry of the city, and eventually, the Philippines.

6.2. Possible Investment Entry Points

6.2.1. Engaging in Halal Broiler Production

Engaging in *Halal* broiler production will increase the volume of production of *Halal* broilers in the country and improve the *Halal* industry of the city. Further, based on the survey conducted, on average, consumers are willing to pay a 12% higher price for *Halal* broilers, which will give producers and processors incentives to go into *Halal* broiler operation. The estimated annual chicken consumption of Muslims in the Philippines in 2010 is 23,408,798.83 kg, and it is expected to increase since the number of Muslim Filipinos is also increasing.

6.2.2. Cold Storage and Transportation Facilities

The recent "Muslim Friendly" *Halal* food ordinance mandates that cold storage and transportation facilities used for *Halal* food should not be used for non- *Halal* goods. There are at least 10 delivery trucks arriving at the dressing plant of BAVI and VITARICH every day, and none of these trucks are exclusively used for *Halal* broilers, so there is a need for *Halal* transportation facilities. In addition, the Davao City ordinance of *Halal* segregation will force supermarkets and food processors to invest on or to rent cold storage facilities for *Halal* products only.

6.2.3. Halal Meat Shops

Halal meat products are commonly seen in wet and dry markets where the display area is non-exclusive to *Halal* products. Sometimes, there are products labeled with *Halal* but are being displayed side-by-side with *Haram* products. Having *Halal* meat shops will avoid contamination that will render the product *Haram.* Also, having a meat shop allotted for *Halal* products only is more convenient for Muslim consumers as the doubt of if the product is truly *Halal* will be minimized.

It is also timely to have *Halal* meat shops in Davao City in line with the recent city ordinance mandating the segregation of *Halal* foods from those non- *Halal*. Supermarkets will find difficulty in following the mandate since the storage area for *Halal* goods should also be different from non- *Halal* goods.

6.2.4. Halal Feeds Production

There are small-holder farmers that wanted to venture into *Halal* broiler operation; however, the limited supply of *Halal* feed prevents successful *Halal* operation. Formulation of *Halal* feed is the same with those that are commercially available, except that certain ingredients are not to be included, such as porcine products, because they are *Haram.* At present, EMACC *Halal* feed is the only *Halal* feed producer in Davao City, but its capacity is still not comparable to large feed producers.

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The Effects of Medical Service Quality on Customer Revisit Intentions: The Mediating Effects of Commitment

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ABSTRACT

As competition among healthcare institutions becomes stronger in the healthcare service market, service quality may significantly affect customer satisfaction. This study was based on the hypothesis that commitment to service could improve satisfaction, intention to revisit, and promote competition among healthcare institutions. It aimed to analyze structural causal relations through theoretical research and empirical testing of service quality. To do this, data were collected from a panel possessed by a research institution and empirical analysis was performed using SPSS 24.0 with a covariance structure model based on the theoretical research. First, frequency analysis was conducted to examine the demographic characteristics of the subjects. Second, Cronbach's alpha was measured for descriptive statistics and internal consistency. Third, factor analysis was performed to remove unnecessary variables and to confirm the validity of the measurement items, and the reliability and validity were verified. Fourth, pearson correlation analysis was performed to check interrelationships and multiple collinearity among variables. Fifth, path analysis was performed on SPSS24.0 in order to verify the causal relation between variables, that is, the research hypothesis. Hierarchical analysis was used to identify the priorities of influence and to analyze the mediating effect of the commitment. The results suggest that efforts to improve service quality (distributive, procedural, and interactional fairness) make users more satisfied, improve customer loyalty, and lead to revisitation for a healthcare institution.

Keywords: commitment, medical service quality, overall service quality, personal service satisfaction, revisit intention
JEL Classifications: I15, N75

I. Introduction

Although the healthcare service market has recently been in a financial crisis, increases in concerns about health and quality of life have increased demand for healthcare services. In this context, the government has made efforts to meet the people's demands for various kinds of healthcare services by developing various healthcare and welfare policies and rapidly expanding the market. While the purpose of using a healthcare institution was to get treatment in the past, more and more people have recently used a healthcare institution for the purpose of prevention and medical check-ups, and it is urgent for healthcare institutions to

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develop various types of healthcare services for this purpose. While such healthcare institutions such as large-scale, university, and special hospitals fortunately understand and cope with healthcare consumers' demands and needs quickly, small and medium facilities fail to cope well with the changes due to the past customs and habits. This can make small and medium hospitals and clinics less competitive, worsening their performance, giving poor healthcare service to consumers, and ultimately consolidating hospital polarization. It is therefore necessary for healthcare institutions themselves to know the fact that they can survive only by improving customer service and service quality, and to make strategies for improving service. This study aimed to analyze the factors affecting satisfaction with the quality of service by healthcare institutions in terms of customer commitment so that healthcare institutions can improve service satisfaction and become more competitive through customer satisfaction. This study was based on the theoretical ground that for the perceived quality of service by healthcare institutions, commitment might affect personal and physical service satisfaction, thus increasing customer revisit intention, which is composed of reuse and word-of-mouth intention. Wide-ranging research has been conducted in diverse areas of service; more narrowly, a few studies have been conducted in the service area of healthcare institutions. The existing research focused physical service in the external environment of service companies. In contrast, this study noted that healthcare equipment could be an important factor for physical service by healthcare institutions and focused on satisfaction with physical service based on healthcare equipment rather than the tangible environment. Many authors have conducted research on factors such as service quality, customer satisfaction, and customer loyalty, and this study intended to investigate factors for commitment through the medium of customer satisfaction between service quality and customer loyalty on the basis of a literature review. While many authors found that service quality positively affected customer revisitation, none mentioned factors for commitment. Therfore, this study aimed to make academic suggestions by examining the effects of service quality on customer revisit intention through the medium of commitment in customer satisfaction and to make a practical suggestion that healthcare institutions could become more competitive, as required in the healthcare service market, through efforts to improve service quality and satisfaction for customers.

Many studies on service quality have been conducted on how customers respond to service providers' coping with the failure in service and have been mainly based on the theory of quality. However, there are limitations in explaining customers' negative responses because consumers' ideas and responses are not made by cognitive judgment alone. It is therefore necessary to understand the evaluation of customers' emotions as well in discussing the effects of service recovery.

II. Theoretical Background

2.1. Medical Service Quality

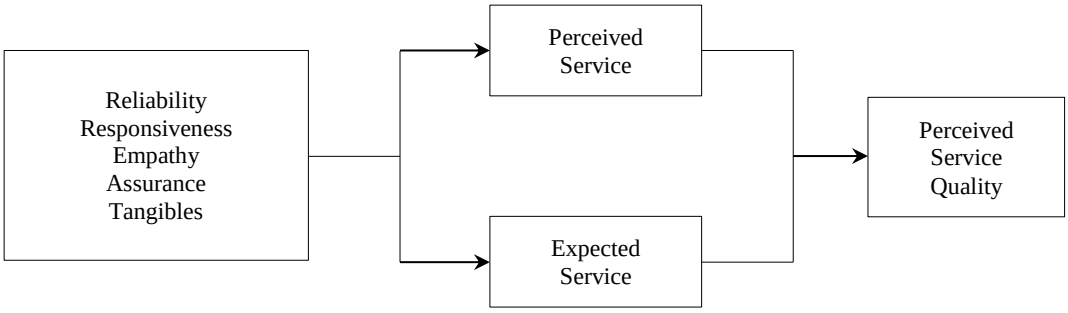
Healthcare is an intangible service based on human resources and is characterized by a situation in which poor customer service can make it difficult to maintain relationships with customers. One of the characteristics of intangible service is that it is produced and consumed at the same time; that is, healthcare service is generated and consumed during communication with a patient and failure to have a good understanding of the idea of healthcare service can lead to errors in hospital management. Kim (2013) noted that since healthcare service was intangible and a result of behavior, it was almost impossible to make products tangible through uniformization or standardization, and to test, store, or measure them, causing a service manager to have difficulties in understanding how customers perceive, measured and understood service quality. Healthcare service is most likely to be

intangible and one cannot use a product before purchasing it or evaluate it, even when receiving it in many cases; for example, patients having surgery or a medical check-up may have no ability to determine if each procedure involved was high-level, and may only have a single chance to purchase a ceratin type of healthcare service in their lifetimes (Jeon, 2010). Therefore, the quality of healthcare service, which is intangible, is a factor determined by patients' subjective judgment. As such, this study noted that evaluation or perception of medical service quality could depend either on researchers' ideas or on patients' personal characteristics.

While the importance of medical service quality has been emphasized, poor medical service quality can harm health and place a financial burden on people due to excessive medical treatment and others in a social respect. In evaluating medical service quality, Donabedian (1988) divided it into three areas. First, it is the medical staff's ability to give medical treatment from the perspective of providers. Second, it is customers' feelings about the provided healthcare service as determined by their needs or expectations. Third, it is to provide and manage healthcare so that many people can benefit (Kim, 2014). Provider-based quality refers to an ability to give medical treatment, such as accuracy of diagnoses, excellency in healthcare techniques, and skillfulness. The quality perceived by patients, who are consumers of healthcare service, refers to the functional quality that shows how the provided healthcare service, including healthcare techniques, meets the expectations and needs of patients, who are consumers (Jeong, 2015). Medical service quality can be evaluated from several perspectives, service providers or beneficiaries and society, and this study evaluated it from the perspective of patients.

While Medical service quality has been based on SERVQUAL (Fig. 1), it has recently been measured in diverse ways according to researchers' goals and characteristics. This study intended to be based on Fig. 1 in measuring it in two aspects; 1) physical service, which is composed of hospital facilities or environment, accessibility, and convenience; and 2) personal service, which is composed of the medical staff's expertise, kindness, and communication. In particular, it is necessary to interpret Medical service quality, which is intangible, comprehensively because it is evaluated by patients' subjective judgments.

Fig. 1. SERVQUAL Model



Source: Parasuraman, Zeithaml, and Berry (1988).

The external acts accidentally generated in terms of healthcare behavior as well as diagnosis, treatment, and prescription are defined as economic goods, and healthcare service is composed of essential services, which are medical behaviors personally provided by medical staff and additional healthcare services provided by hospitals. Healthcare service is an immediate service for patients and can be treatment and a standard for estimation of insurance fees. The scope of healthcare service provided to patients needs

to cover both inpatient and outpatient treatment and include a range of treatment provided by legally recognized healthcare personnel (Hwang, 2001). The additional service is related to extra-healthcare services, such as physical and administrative services, which are personal or environmental services. Bowers and Taylor (1990) noted that healthcare service was essentially a unified service more complicated than general service and suggested the following characteristics.

2.2. Hospital Service Users' Service Determinants

2.2.1. Physical Service

2.2.1.1. Hospital Servicescape

Providing essential service based on the physical environment can maximize customer satisfaction. The importance of such convenience is a very important index recently in the healthcare service industry. Healthcare institutions have recently used up-to-date equipment and technology to make themselves modern and advanced, introduced various colors rather than white to reduce customers' (patients') aversion, and performed diverse types of cultural marketing with cultural and convenience facilities, including bookstores and shopping malls. Bitner (1992) conceptualized the physical and convenient environment of service as a servicescape, as compared with the natural and social environment, and defined it as an artificial, physical facility. Lee and Kim (1998) defined the physical and convenient environment of service as 'specific physical factors that healthcare institutions can control to reinforce acts of employees and consumers.' This physical and convenient environment is a service evidence of customers' purchase behaviors and plays an important role in delivering the image and goal of the company. This is because users make decisions in the purchase environment, and it is the servicescape that plays an important role in determining the level of service they will receive (Russell & Lanius, 1984: Russell & Pratt, 1980). The finding that the physical environment and factors of healthcare institutions can contribute to the formation of positive images and an improvement in satisfaction among customers has already been proven by several authors. Park and Cho (2010) found that the factors for service scape in fast food restaurants, namely pleasure, convenience, and spatiality, positively affected customer satisfaction. Found that the higher the level of pleasure, aesthetics, modernity of equipment, and doctors' expertise, components of the servicescape for healthcare, the higher the level of trust and customer satisfaction. A study on the effectiveness of the physical environment applies to diverse areas, including hotels, food service, resorts, and healthcare, and contends that managing physical convenience effectively can not only affect customers' purchase behaviors but also help achieve the final goal of a service company. This study intended to measure the physical environment as the factor of 'convenience' and compare the level of expectations and satisfaction with other variables on the basis of convenience among various components, as revealed by literature review.

2.2.1.2. Accessibility

Accessibility refers to the possibility to access a certain region or facility, and is generally determined by distance, travel time, and attractiveness. It is the level of users' utilizing transportation, facilities, goods, service, rights, and information communication networks without inconvenience, and it is perceived as the possibility of accessing the functions and benefits of the systems and objects in the underprivileged bracket of healthcare facility users, including the disabled, elderly, and pregnant. The primary measurement of accessibility focused on convenience in transportation, taking into account access to facilities and patients' convenience in use as well. This study examined accessibility by determining if the healthcare institution was located so that customers (patients) could use it conveniently on the basis of facility placement, space, convenience of facilities in receiving treatment and examinations, finding a department for treatment, and ease use of service in placing facilities.

2.2.1.3. Convenience

Convenience refers to a system for easy movement. Convenience and ease of access contain comprehensive items, ranging from the exterior of a healthcare institution to visual and mental perceptions with neat designs, individuality, and uniqueness. The factors that determine favor in convenience are similarity, interactive evaluation, and physical proximity and familiarity. Similar values, tastes, attitudes, and emotions tend to generate strong favor (principle of similarity). A person with a positive evaluation tends to like similar individuals and evaluate him/her favorably (principle of interactivity). The more similar the target, the more use and strong probability of generating something familiar to the perceiver. Familiarity can cause them to believe that they are well aware of each other and can predict behavior, feeling comfortable and feeling stronger favor (principles of proximity and familiarity). When closer to each other, they may feel more comfortable because they know that they can make convenient use of each other as needed. Even from the perspectives of rational calculation and social exchange theory, healthcare institutions that can give help anytime and grant stronger favor. The tendency to maintain cognitive consistency can make nearer healthcare institutions more attractive and favorable.

2.2.2. Personal Service

Personal service is composed of the medical staff's expertise, kindness, and communication. This refers to immediate services, including treatment, counseling, education, rehabilitation, and vocational training, which are provided to individuals on the basis of interpersonal relationships among the services generally provided through healthcare policies and systems. Its function is wider-ranging than social work, which is the practice of healthcare and welfare professional. It reportedly includes personal service to promote the development of sociology, give treatment, make new service utilization, or give information about a service (Dictionary of Social Welfare, Lee et al., 2009). As consumers have become more aware of their rights, even healthcare consumers try to decide to participate actively in any decision concerning surgery, treatment, and medication performed. Doctors need to give patients (consumers) a full explanation of symptoms, treatment methods and contents, needs, and expected risks and side-effects so that they can make a final decision on treatment before starting medical practice. The goal of personal service in healthcare is to preserve patients' lives, cure diseases, and recover and maintain the functions of the body. In personal service, it is necessary to meet patients (consumers) on the basis of their cultural levels, taking their age and gender into account, respect their character, and promote spontaneous participation. If the medical staff indicate that they know the patients by calling them by name, it can be of great help in service. Doctor-patient communication can initiate interaction, which can then induce the patient to make favorable responses, thus making personal service reliable and constant.

Consumers satisfied with such healthcare service can continue behaviors such as positive word-of-mouth, and those dissatisfied can give negative word-of-mouth or stop purchasing. Consumer satisfaction can affect consumer attitudes, which can then affect intention to revisit the healthcare facility. Cronin and Taylor (1992) noted that purchase intention might never end with a single purchase between a consumer and a company, and could continue to appear, depending on service satisfaction. Consumers' post-purchase behavior is important marketing information in that it may not only reflect final evaluation of the purchased goods but also affect future purchase behavior. In particular, the continuous use intention is used as the most immediate index for consumers' determination of whether or not they use the goods or services again, and this is measured by many companies.

2.2.3. Commitment

Commitment is an essential element in building a successful relational exchange, and inter-partner commitment serves as a strong relational indicator (Gundlach et al., 1995). In the area of service market-

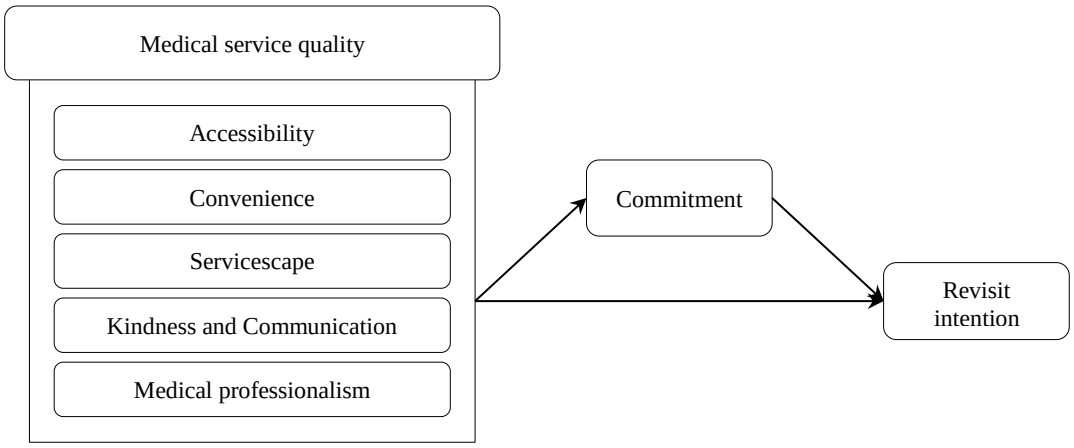
ing, Morgan and Hunt (1994) defined commitment to relations as the belief that constant relationships with an exchange partner are important enough to make best efforts to keep relationships. This definition implies that commitment is constant and that a certain relationship is positively evaluated. In other words, the committed one believes that it is worthwhile to make efforts to keep the relationship indefinitely. Mathieu and Zajac (1990) divided commitment into affective and calculative commitment, and contended that commit-ment involved different motives to maintain a relationship. According to affective commitment, affectively-bound members, who enjoy relationships and like companionship, want to maintain the relationship and, ultimately, obtain a sense of belonging and loyalty. Calculative commitment is defined as the degree of perception of the need to maintain the relationship due to switching costs or a very serious end expected in relation to relationship breakdown. This is shown as a clear calculation of costs and benefits, including availability of alternatives or compensation for the existing investment and evaluation based on the investment in the relationship. However, they basically have the same content, and this study divided this into affective and calculative commitment.

III. Methods

3.1. Research Model

In previous research, the service quality of a medical institution was identified as 5 sub factors as in previous studies: accessibility, convenience, service-scape, kindness and communication, and medical staff's expertise. To analyze research that immersion would play a mediating role in the hypothesis that the intention to revisit will increase if the quality of medical service is enhanced was the goal.

Fig. 2. Research Model



3.2. Research Hypothesis

There are prior studies on the effect of medical service quality on revisit inquiry. However, these are research hypotheses on the role of immersion as mediator.

H1 : Commitment will play a mediating role on the positive (+) impact of medical service quality on repeat intentions.

H1-1: Commitment will play a mediating role on the positive (+) impact of accessibility on re-visit intention

H1-2: Commitment will play a mediating role on the positive (+) impact of medical service quality (convenience) on repeat intentions.

H1-3: Commitment will play a mediating role on the positive impact of servicescape on intention to revisit.

H1-4: Commitment will play a mediatory role in the effect of kindness and communication on the intention to revisit (+).

H1-5: Commitment will play a mediating role on the positive impact of medical staff expertise on intention to revisit.

3.3. Research Model

3.3.1. Operational Definition of Variables

3.3.1.1. Medical Service Quality

This study measured medical service quality on the basis of a literature review. Physical service involved access to hospital facilities and environment, and personal service involved expertise and communication. The items were drawn from the empirical research on medical service quality, ethical management, and organizational performance of hospitals (Kim, 2011) and the research on the factors affecting the medical staff's healthcare services and the intention to purchase hospital services were revised and supplemented, and 17 items were finally used to measure these with a five-point likert scale (1 totally disagree, 3 average, and 5 totally agree).

3.3.1.2. Commitment

The items from Fullerton (2005) and Robson and Coates (2014) were adapted to this study to measure commitment and a five-point likert scale (1 totally disagree, 3 average, and 5 totally agree) was used with a total of four items: (a) Priority is given to patients in managing this healthcare institution; (b) I have good relations with this healthcare institution; (c) I feel the counselor in this hospital and I are like family to each other; (d) This hospital is willing to make investment in the creation of the best environment for customers.

3.3.1.3. Revisit Intention

Four items were drawn, revised, and supplemented to measure revisit intention using a five-point likert scale (1 totally disagree, 3 average, and 5 totally agree): (a) I plan to visit this healthcare institution again; (b) If I have a chance, I hope to use this healthcare institution again; (c) I plan to use this healthcare institution; (d) I will recommend this healthcare institution to my friends.

3.3.2. Data Collection & Analysis

3.3.2.1. Data Collection

To test hypotheses, an online research company was asked to conduct a survey of healthcare service users. It was conducted for seven days from June 3 to 10, 2017, and a total of 450 questionnaires were returned. With the exception of those containing insincere answers, a total of 431 copies were finally analyzed.

3.3.2.2. Data Analysis

The collected data were analyzed using SPSS 24.0. First, frequency analysis was performed to investigate the respondents' demographic characteristics. Second, Cronbach's Alpha was estimated for a reliability test of internal consistency along with the descriptive statistics of each item. Third, exploratory factor analysis was performed to validate the items, with unnecessary variables removed, and reliability and validity were tested. Fourth, Pearson correlation analysis was performed to determine interrelation and multicollinearity among the variables. Fifth, path analysis was performed using SPSS 24.0 to test inter-variable causal relations between hypotheses. Hierarchical analysis was performed to prioritize influences and the mediating effects of commitment were analyzed.

IV. Results of Empirical Analysis

4.1. Characteristics of Sample and Validity Analysis

The demographic characteristics are as follows: 215 respondents (49.4%) were male and 220 (50.6%) were female. 142 respondents (32.6%) were aged 18-29, 147 (33.8%) 30-39, and 149 (33.6%) ≥40. 39 respondents (9%) were high school graduates, 347 (79.8%) college graduates, and 49 (11.3%) graduate school graduates. As for healthcare institutions recently visited, 217 respondents (49.9%) visited a dentist, 127 (29.2%) a dermatologist, 25 (5.7%) a plastic surgeon, and 66 (15.2%) an ophthalmologist.

Table 1. Factor Analysis

Division	Factor	Variable	Load Capacity	Eigenvalue	Dispersion Strength	Cronbach
Medical Service Quality (13)	Accessibility	Sv9	0.793	3.302	25.404	0.855
		Sv7	0.748			
		Sv8	0.737			
		Sv10	0.679			
		Sv12	0.661			
	Convenience	Sv3	0.868	1.755	38.907	
		Sv4	0.750			
	Servicescape	Sv14	0.709	1.614	51.324	
		Sv13	0.703			
	Kindness & Communication	Sv1	0.843	1.583	63.505	
		Sv2	0.788			
	Medical Staff Expertise	Sv17	0.853	1.440	74.578	
		Sv15	0.806			
Commitment	Single Variable	C1	0.870	2.907	72.037	0.871
		C2	0.852			
		C3	0.823			
		C4	0.811			
Revisit Intention	Single Variable	I 1	0.873	2.856	71.348	0.866
		I 2	0.841			
		I 3	0.821			
		I 4	0.807			

4.2. Validity Analysis

4.2.1. Factor Analysis & Reliability Analysis

Table 1 shows the factor analysis of medical service quality, commitment, and revisit intention. In the same way as the theoretical structure in the results of the previous research on medical service quality, five factors were drawn. They were accessibility, convenience, servicescape, medical staff expertise, and kindness and communication. 4 out of 17 items were deleted because they failed to meet any factor. Medical service quality was very reliable (0.855). For commitment, a single factor was drawn from literature review. Its reliability was estimated at 0.871. Lastly, revisit intention was very reliable (.866). It can be said that commonality is a rate explained by the drawn factors. It is recommended that variables at lower levels of commonality (generally ≤ 0.4) be excluded from factor analysis. The analysis found that every variable was at ≥ 0.6 for commonality.

4.2.2. Correlation Analysis

Table 2 shows the correlation analysis to determine if relations among independent variables are significant. That is, it aims to determine correlation among quantitative variables. Pearson's method, which is the most frequently used variance analysis, was used. Pearson's correlation coefficients range from 0 to 1: the closer to 1, the less correlated; the closer to 1, the more correlated. As for the strongest correlation, commitment and service accessibility had a high correlation coefficient of .758.

Table 2. Correlation Analysis

	Accessibility	**Convenience**	**Servicescape**	**Kindness & Communication**	**Medical Staff Expertise**	**Commitment**	**Revisit Intention**
Accessibility	I						
Convenience	.295**	I					
Servicescape (Facilities, Environment)	.586**	227**	I				
Kindness&Communication	.616**	.321**	.583**	I			
Medical Staff Expertise	.667**	.181**	.675**	.627**	I		
Commitment	.734**	.257**	.705**	.650**	.775**	I	
Revisit Intention	.222**	.298**	.257**	.341**	.246**	293**	I

4.3. Hypothesis Testing

4.3.1. Regression Analysis

Table 3 can be explained as follows. For the effects of medical service quality on revisit intention, all factors but service accessibility and SV convenience were estimated at .00, which is smaller than .05, and the hypothesis was adopted. As for medical service quality, servicescape, kindness and communication and medical staff expertise affected revisit intention. Accessibility (0.459) and convenience (0.170), which were larger than .05, were rejected.

4.3.2. Testing Mediating Roles of Commitment

Table 3 can be explained as follows.

While parameters affect dependent variables in the same way as the independent variables, they are variables between the independent and object variables in terms of sequence. In other words, they are affected by the independent variable and affect the dependent variable at the same time.

SPSS analysis of the mediating effects can be performed as follows. First, it is necessary to test significance of the relationship between the independent variable, medical service quality, and the parameter. The relation should be significant. Second, it is necessary to test the significance of the relation between the independent variable and the object variable, which should be significant. Lastly, it is necessary to test significance of the effects of the independent variable of medical service quality and the parameter of commitment on the dependent variable of revisit intention. The effects should be significant. As for beta values, the mediating effects are recognized when the last third stage is larger.

Table 3. Regression Analysis and Mediating Effect

Independent/ Mediated / Dependent	Step	Normalized Value	T Value	P Value	R^2 Value	Mediated Effect
Accessibility/ Commitment/ Revisit Intention	Step 1	0.244	5.228	.000	0.059	N
	Step 2	0.052	0.741	.459	0.870	
	Step 3	0.253	3.585	.000		
Convenience/ Commitment/ Revisit Intention	Step 1	0.202	4.288	.000	0.041	N
	Step 2	0.073	1.374	.170	0.090	
	Step 3	0.256	4.803	.000		
Servicescape/ Commitment/ Revisit Intention	Step 1	0.247	5.292	.000	0.610	Y
	Step 2	0.116	2.063	.040	0.095	
	Step 3	0.225	4.001	.000		
Kindness&Communication Commitment/ Revisit Intention	Step 1	0.22	4.682	.000	0.480	Y
	Step 2	0.154	3.259	.001	0.108	
	Step 3	0.252	5.35	.000		
Medical Staff Expertise/ Commitment/ Revisit Intention	Step 1	0.238	5.088	.000	0.057	Y
	Step 2	0.201	4.42	.000	0.125	
	Step 3	0.265	5.817	.000		

The hypothesis testing obtained the following results. Regression analysis was performed to test the hypothesis that medical service quality perceived by patients would affect revisit intention through the medium of commitment. The results are as shown in Table 3. Specifically, when the hypothesis that accessibility would affect revisit intention through the medium of commitment was tested, the first-stage regression coefficient was 0.244, the second-stage regression coefficient was 0.052, and the third-stage regression coefficient was 0.253.

When the hypothesis for the second factor was tested, the first-stage regression coefficient was 0.202, the second-stage regression coefficient was 0.073, and the third-stage regression coefficient was 0.256. When the hypothesis for the third factor was tested, the first-stage regression coefficient was 0.247, the second-stage regression coefficient was 0.116, and the third-stage regression coefficient was 0.252. When the hypothesis for the fourth factor was tested, the first-stage regression coefficient was 0.220, the second-stage regression coefficient was 0.154, and the third-stage regression coefficient was 0.252. When the hypothesis for the last factor, medical staff expertise, was tested, the first-stage regression coefficient was 0.238, the second-stage regression coefficient was 0.201, and the third-stage regression coefficient was 0.265. As for every variable, beta values varied through the medium of commitment. However, accessibility and convenience, which were out of the significance level, were rejected and partially mediated.

4.3.3. Results of Hierarchical Regression Analysis of Medical Service Quality and Commitment

Table 4. Hierarchical Regression Analysis

Independent	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
	SE	β	T	SE	β	T	SE	β	T	SE	β	T	SE	β	T	SE	β	T
-	0.174	-	12.581	0.186		11.519	0.201		10.154	0.202		9.893	0.234		6.891	0.262		4.182
C	0.050	0.293	6.358	0.077	0.253	3.585	0.078	0.243	3.426	0.079	0.216	2.996	0.078	0.222	3.114	0.077	0.213	3.038
A				0.078	0.052	0.741	0.083	0.020	0.265	0.090	-0.043	-0.532	0.090	-0.087	-1.065	0.089	-0.085	-1.060
C							0.059	0.068	1.185	0.059	0.076	1.327	0.061	0.021	0.362	0.060	0.026	0.446
S										0.059	0.123	2.012	0.058	0.143	2.355	0.058	0.114	1.884
K&C													0.057	0.163	3.189	0.056	0.152	3.019
MP																0.049	0.185	4.065
Statistic	R^2=0.086/ Modified R^2=0.083/ F=40.425/ P=.000			R^2=0.087/ Modified R^2=0.082/ F=0.549/ P=.459			R^2=0.090/ Modified R^2=0.083/ F=1.404/ P=.237			R^2=0.098/ Modified R^2=0.090/ F=4.049/ P=.045			R^2=0.119/ Modified R^2=0.109/ F=10.168/ P=.002			R^2=0.152/ Modified R^2=0.140 /F=16.525/ P=.000		

Note: accessibility (A), convenience (CO), servicescape (S), kindness and communication (K&C), and medical staff expertise (MP).

Table 4 can be explained as follows. The relative influence, which is the most important element to test in hierarchical regression analysis, is based on the absolute value of standardized coefficient β in the final model: Model 6. Here, the variables whose effects are at the statistical significance level can be evaluated for relative influence. Commitment had the highest absolute value (0.213). That is, it had the greatest relative influence on the dependent variable of revisit intention. SV medical staff expertise had the second greatest relative influence (0.185). It had the greatest influence on medical service quality. SV kindness and communication had the third greatest relative influence (0.152), and servicescape had an influence of 0.141. That is, commitment had the greatest relative influence, followed by commitment, medical staff expertise, convenience, and servicescape, respectively.

V. Conclusion

This study aimed to indicate the importance of service quality and suggest a strategy for improving satisfaction according to commitment to revisit in pursuit of the continuous growth of healthcare service. To do this, theoretical consideration was made on the basis of a literature review and social phenomena to make and test hypotheses through empirical analysis. It intended to determine the effects on customers' awareness of service fairness and loyalty in the process of solving problems of healthcare service when they chose treatment via coupons or SNS and to see if medical service quality affected customer revisit intentions through the medium of commitment. Commitment fully mediated between healthcare service customer loyalty and revisit. In particular, medical staff expertise in affective commitment had the greatest mediating effect numerically. The medical staff's kindness and communication in service quality strongly affected affective commitment. This result implies that they are affectively aware of interactive medical service quality. That is, they are more committed to communication with the medical staff

rather than to distribution and procedural administration. While patients usually have some knowledge of medical information, such as common sense healthcare, procedures, and treatments, before visiting a hospital, interaction with the medical staff is a more important factor to loyalty intention in practice. That is, it is impossible to know satisfaction of customers and service users through such things as learning and word-of-mouth. This is because service intangibility is a representative characteristic of healthcare service. It also affects testing the hypothesis that trust would have a moderating effect between commitment and customer loyalty. That is, medical service quality, affective commitment, and trust formed organically strong causal relations. This can be described more specifically through hypotheses as follows. The hypothesis that service quality perceived by patients would affect customer revisit through the medium of (affective and calculative) commitment was adopted on the basis of the specific hypothesis that service quality would affect customer revisit through the medium of commitment.

In conclusion, service quality would affect customer revisit through the medium of commitment. That is, they consider revisit intention based upon commitment. Therefore, commitment is very important. Commitment causes patients to form strong customer loyalty through the mediation of trust. That is, the stronger the trust, the more likely to revisit; the weaker the trust, the less loyal the consumer. Trust serves as a principal factor that can determine the frequency and intensity of revisit intention and customer loyalty. Commitment was fully mediated in the research. Full mediation implies that fully committed consumers may think it natural to revisit.

Medical staff expertise among the components of service quality had the strongest influence on revisit satisfaction; those who felt that the medical staff did their best to solve problems, regarded the medical staff as sincere, and whose opinions had been reflected were most satisfied. As for kindness and communication, such factors as when service quality was fair, when problem-solving was better than expected, and when customers needs were met were important for service recovery. As for hospital facilities and environment (service scape), factors such as making the proper period of treatment known and attaching importance to problem-solving by service providers immediately affected satisfaction.

On the basis of these results, it is necessary to show the medical staff's expertise and hospital facilities and environment for medical service quality, give the staff decision-making and financial authorities to solve problems, find and remove the causes of the problems in pursuit of sustainable growth, and develop and apply kindness and communication in service for patients. On the basis of needs, attempts were made to emphasize the importance of practical and efficient service recovery strategies for service in healthcare facilities and to suggest valid plans preferred by patients.

This implies that customers dissatisfied due to service problems can see their dissatisfaction and displeasure changed into satisfaction through service. If the hospital staff politely try to solve unexpected service problems during treatment and suggest proper compensation, it gives a chance to change the patient's inconvenience and dissatisfaction into satisfaction. Since some customers can leave hospital due to poor mutual understanding and poor persuasion during the course of service recovery, it is necessary to make practical strategies for finding and removing the causes of service problems with the objective of preventing the same problems from occurring.

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Copper Mining and the Global Fishery Sector: Selected Country Cases

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ABSTRACT

This paper examines the impacts of mining in the fishery sector of selected country cases, namely Zambia, Canada, Alaska, Northern Chile and the Philippines. Secondary data were utilized to describe the impacts of mining in the fishery sector of the selected countries, except in the Philippines, wherein primary data were gathered through personal interviews of the fisherfolk in Boac, Marinduque, Philippines. Mining may have positive benefits, particularly in the overall economy of the selected countries, but in the fishery sector, only negative consequences have been found. The study enumerates these benefits and the consequences of mining to the fishery sector of the selected countries, and also gives recommendations to address the general welfare of the global fishery sector.

Keywords: copper mining, country cases, global fishery sector, impacts, mining consequences
JEL Classifications: N50, Q17, Q18, Q22

I. Introduction

To date, the Marcopper mining disaster in Boac, Marinduque, Philippines was recognized and documented as one of the most tragic events in mining activity worldwide. The fishing industry in the province was greatly affected, creating a ripple-effect for the stakeholders that depended on the resources from the river system and coastal areas connected to it.

Research has shown that mine wastes can greatly affect the agricultural and industrial sector in the absence of proper waste management. The day that Marcopper Mining Corporation started to operate became the start of the province's natural resource depletion. The reports also emphasized the loss of aquatic animals and organisms as the mine tailings brought toxic waste and heavy metals that polluted the natural habitat. Though this tragedy made history, this study could investigate if globally this could be an isolated case.

Scientists at Michigan State University (MSU) found that mining can damage fish habitats miles downstream, even in streams not directly connected to

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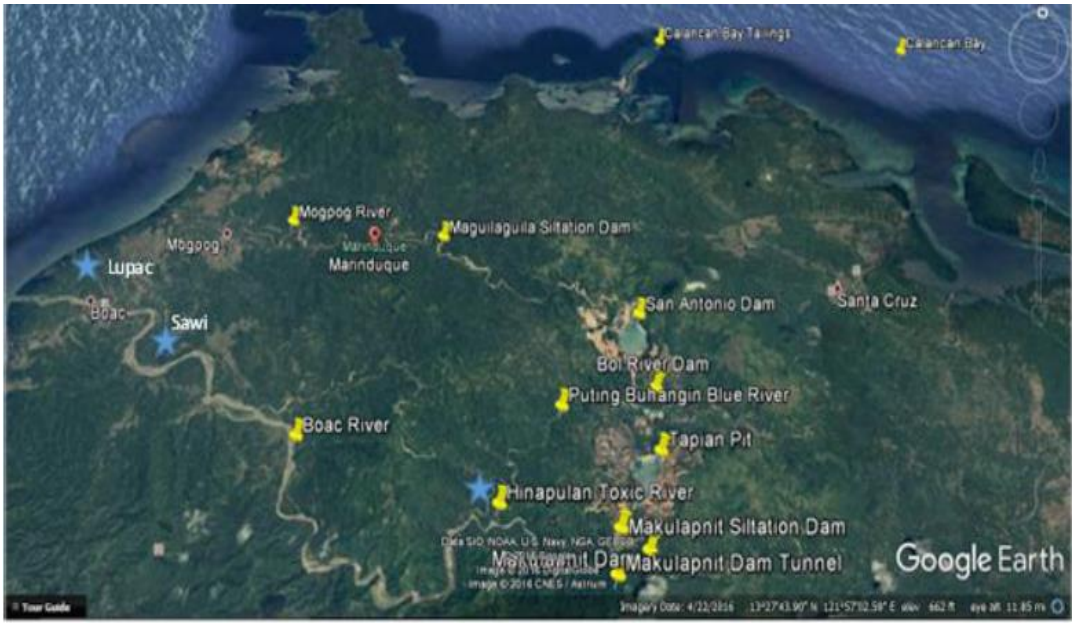
mines (Nichols, 2014). The study covered areas in in the United States typically known for mining, such as Appalachia, and even places where little mining research had been done, such as Iowa and Illinois. According to Wesley Daniel, a research associate at Michigan State University, "mines have a much stronger influence on fish than has been assumed, that is why when considering the location of a new mine, it is important to not just look locally but look way downstream." He also stated that mining disrupts the environment around it as it can add sediment and chemicals to rivers, alter the flow of streams, lead to fewer forests in headwaters, and compact soil. All these in consideration can change fish habitats and eventually wreak havoc on populations of trout or bass and the other smaller fish. In fact, the condition of small streams that flow into larger rivers will affect downstream fish communities since everything is cumulative. Furthermore, the effects of one mine can be associated with altered fish communities, thereby affecting the quality of headwater streams and the quality of rivers.

With the mining industry currently booming on a global scale, it is imperative to examine several country cases that depict the impact of mining in the fishery sector; thus, the pursuit of this study. The main goal of this research is to determine the impacts of mining on the global fishery sector. Specifically, the research aims to: (a) describe the fishery sector of selected country cases; (b) analyze the effects of mining on the fishery sector of selected country cases; and (c) formulate recommendations in addressing the welfare of the global fishery sector.

The study made use of both primary and secondary data. Primary data were obtained through personal interviews with 177 randomly selected fisherfolk from three out of 25 barangays along the Boac River in Marinduque, Philippines, that were affected by the Marcopper mining incident. As shown in Fig. 1, these barangays are Lupac, Sawi, and Hinapulam, which are the top three barangays with the most number of fisherfolk.

Fig. 1. Visual Representation of Study Area: Lupac, Sawi, and Hinapulam Barangays



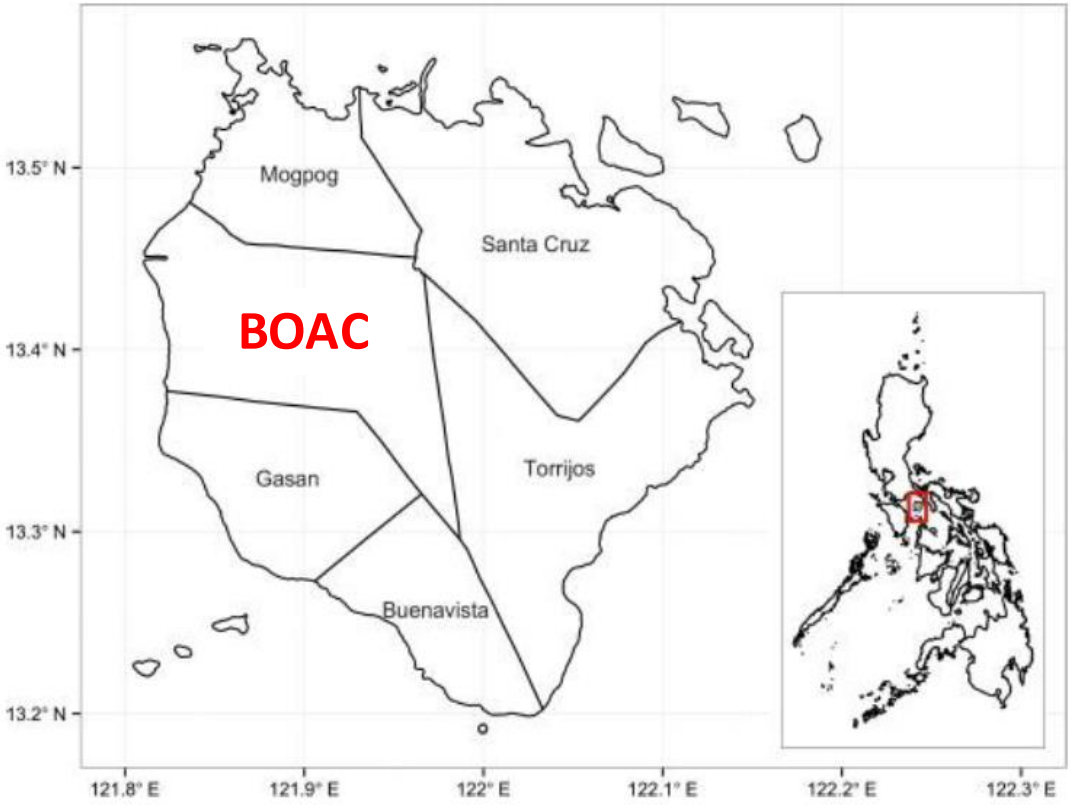
Source: Google maps (n.d.).

Secondary data on mining were obtained from online and published sources, particularly information on selected country mining cases. Philippine government agencies, such as the Bureau of Fisheries and Aquatic Resources (BFAR), the provincial and local government of Boac, Marinduque, and the Marinduque Council for Environmental Inc. (MACEC), also provided secondary information on the province and the Marinduque mining incident. Collected data were analyzed by means of qualitative or descriptive data analysis, particularly in the discussion of the various country cases on mining.

II. Review of Related Literature

Marinduque Island is located about 170 kilometers south of Manila and belongs to Region IV-B MIMAROPA (Fig. 2). It has a population of 235,000 (Philippine Statistics Authority, 2015) and consists of six municipalities, namely Boac, Gasan, Buenavista, Torrijos, Mogpog and Santa Cruz. The municipality of Boac is the island's capital and seat of the province's commercial businesses. It is composed of 61 barangays with a population of 54, 730 as of 2010 (PSA, 2010).

Fig. 2. Map of Marinduque



Philippine mineral resources are estimated to be the fifth richest in the world (ADB, 2008). In 1994, the country was composed of 7 billion metric tons of metallic mineral reserves and 50 billion metric tons of non-metallic reserves. The metallic mineral resources were comprised of copper at 72% and nickel at 16%, while for the non-metallic minerals, limestone accounted for about 39%, and marble 29%. The Philippines is also considered one of the best endowed nations in chromite resources, with the Zambales

province having one of the largest refractory chromite resources in in the world (NSCB, n.d.b). By mid‑2008, the country already had 39 operating mines and more than 2,000 small-scale mines and quarries, which, for the most part, are mineral resources that are yet to be fully tapped.

Copper mining maybe important to human development, but it does not come without costs, as terrestrial copper mining entails significant and permanent ecological impacts (The Nautilus Minerals, n.d.). This includes impacting the local biodiversity, surface water and groundwater in a negative way. Moreover, severe and irreversible degradation of land ranging from forests to wetlands and from deserts to coral reefs often occur. These mines generally move earth on a large scale as tailings from underground or surface mines are typically measured in the hundreds of millions of metric tons. Furthermore, terrestrial mining also involves impacts to indigenous peoples, communities, farms, towns, cities and coastal areas. Such is the case of the Marcopper mine in Marinduque, Philippines, which has become a prime example of the catastrophic effects that mining disasters can create. It can be taken into account that such an incident has been widely cited globally by many in this context.

In 1996, a retention dam at the Marcopper mine in Marinduque, Philippines, failed, resulting in 84 million metric tons of mine tailings being freed (The Nautilus Minerals, n.d.). Mine tailings are defined as finely ground rock, considered a waste product of mineral processing operations, that contain leftover chemicals and are commonly dumped in a form of water-based slurry (Environmental Law Alliance Worldwide, 2010). Four million metric tons, rich in sulphuric acid from copper leaching, were released into the Makulapnit-Boac river system. The spill flooded over two-dozen communities wherein 12 fishing villages were impacted; the river's stretch, nearby towns, and coral reef at the river's outlet have all been smothered with mine tailings.

III. Results and Discussion

3.1. Selected Country Cases

3.1.1. Boac, Marinduque, Philippines

As mentioned earlier, the communities and fishing villages surrounding the Makulapnit-Boac river system were gravely affected by the Marcopper mine in Boac, Marinduque. In particular, the three major bodies of water affected by the mine tailing spill include the Calancan Bay, Mogpog River and Boac River. The study took into account the observable effects of the mine tailings in both soil and water. Formation of mud-like substances under the sea and riverbed were noted as the most frequent observable effect of the incident. This mud-like substance covered the habitat of aquatic wildlife and caused increased cloudiness in the water. As this substance covered the sea and the riverbed, the destruction of corals, river grasses, and seaweeds have been the second most frequent observable effects of the disaster. Another is the change in the smell of the river and the sea, which is now a foul smell experienced by most of the residents comparable to metal, sulphur, rust and so on. Lastly, there was also a noticeable change in the color of the soil in the river and the coastal area that ranged from rusty color, black, and even red in some areas.

Aside from the effects on the soil, effects on the Boac River water and the surrounding coastal areas were also detected. A decrease in aquatic wildlife and activity in the bodies of water was found to be the most frequently observed evidence for water resources.

The respondents noted that aquatic life and aquatic activity present in both the river and sea began declining at an increasing rate as soon as the Marcopper site started to dump waste in the water. This led to some abundant crab species in Marinduque, locally known as '*butgay'* and '*bagtok'*, to disappear as these species poisoned by the chemicals present in the waste materials that caused its extinction. Moreover, the fish and other marine life have moved away to deeper parts of the sea since most of the corals and seaweeds have already been destroyed.

The impacts of mine wastes on the natural resource resulted in the degradation of the water and soil of the river and coastal areas. It also decreased the aquatic yield of the fisherfolk, thereby destroying their livelihoods. The pollution also damaged the main source of water, which residents use in washing, irrigation, water for animals, and for other household chores. Such a loss in water and soil quality has a direct impact on productivity, even in farming. The effect is long term, thus making it hard for crops and aquatic animals to survive. With a low rate of survival, production yields from both land and water resources have been greatly affected.

With mining boosting the province's overall economy, the local residents affected by the mine tailing incident individually experienced the adverse effects of mining activities on their finances. After the spill, their fish catch decreased in volume, thereby directly affecting their daily income. The fisherfolk's yield before and after the mine spill are summarized in Tables 1 and 2, and this indicates a decrease in the overall volume in yield of fish and other aquatic animals, such as shrimp and snails. Before the spill, the fisherfolk mostly produced five kilograms, with an average of 7.89 kg. After the spill, the production of most fisherfolk was reduced to 0.5 kilograms, with an average of 1.24 kilograms. The maximum and minimum number of kilograms also decreased from 50 kilograms to 10 kilograms per day to between one to 0.5 kilograms, respectively. Table 2 gives a further breakdown of the fisherfolk's individual daily production volume.

Table 1. Daily Production Volume of of Fisherfolk Before and After the Mine Tailing Spill

Volume of Production per da (kg)	Mode	Mean	Maximum	Minimum
Before the spill	5.0	7.18	50	1.0
After the spill	0.5	1.17	10	0.5

Table 2. Frequency Count For Production Volume Before and After the Mine Tailing Spill (n=177)

Volume of production per day (kg)		No. of Fisherfolk	Percentage
Before the spill	5.00	49	28%
	3.00	37	21%
	10.00	29	16%
	6.00	21	12%
	4.00	12	7%
After the spill	0.50	117	66%
	2.00	22	12%
	1.00	16	9%
	3.00	10	6%
	5.00	6	3%

Before the Marcopper mine tailing incident, barangays Hinapulan, Lupac, and Sawi solely relied on fishing as the source of livelihood in the river and coastal areas. Fisherfolk earning below PhP6,374 per month comprise 68.9% of the total respondents, while 15.81% have an income from PhP6,375 to PhP10,509 per month. A majority of the respondents' incomes were considered relatively low compared to other income sources. This can be attributed to the lack of advanced fishing equipment and even limited basic fishing gear, such as bamboo fishing nets and traps, further contributing to the low income they receive. Despite the limited income generated from fishing, the respondents felt that such was enough to support daily household needs before the mining tragedy. After the mining tragedy, these communities became vulnerable to livelihood adversities as they do not have alternative livelihood sources.

3.1.2. Copperbelt Province, Zambia

When Zambia gained its independence in 1964, copper mining became the heart of the country's economy and a dominant force in shaping the Copperbelt Province (Kangwa, 2008). Copper mining brought the establishment of mining towns, which drew workers from rural areas in search of jobs and access to housing, infrastructure and a variety of social amenities. Consequently, the mining sector was the second largest employer after the government, and generated about 85% of foreign exchange earnings. Despite the identified economic benefits of income and employment in copper mining activities being offered in Zambia, it has negatively impacted the environment and people. As the government's main focus has been to attract investors to the country through an investor friendly environment, Zambia's social and environmental issues have then been pushed aside.

Kangwa (2008) identified the three most common and serious problems in copper mining: (1) sulphur dioxide emissions from smelters; (2) heavy-metal effluents released into water systems; (3) mining wastes generated that take up productive pieces of land and run the risk of chemical seepage into ground water. Aside from the obvious effects on human inhabitants in the area, the impacts of the copper mines on aquatic life cannot be undermined.

In Zambia, the Kafue River serves as a source of potable water for approximately 40% of the Zambian population and as life support for the industrial, mining and agriculture sectors. One of the major fisheries that supports thousands of households whose livelihoods depend on fishing and river bank cultivation of food crops is also located here. In fact, the river accounts for 10% of fish produced in Zambia and employs over 6,000 fishermen.

Unfortunately, the Kafue river became the ultimate discharge of copper, wherein the bioavailability and bioaccumulation of copper in water and sediments is facilitated by fish absorption. It has been found that the concentrations of copper in the Kafue River sediments range between 11,028 to 12,855 μg/g, and the dry mass in the mining area exceeds those of other polluted river sediment worldwide. Table 3 shows one of the ecological consequences of high copper concentrations, wherein an evident decline in fish production in the Kafue River of 2.5% between 1996 and 2003 can be observed via reduced fish populations.

Table 3. Annual Fish Production in Metric Tons in the Kafue River

Year	1996	1997	2002	2003	% change
Production	6293	6479	6316	6137	2.5

Source: Kangwa (2008).

Research also reveals the mortality rate of juvenile fish due to water highly polluted with copper. It has also been reported that young Tilapia fish cannot survive due to high copper concentrations in the Kafue River within the mining area. It should be noted that the Kafue River is home to 122 fish species, including the Zebra fish *(Danio sp)*, which is seriously endangered due to environmental changes. Because of this, the hatching rate and mean survival time for Zebra fish in the Kafue River are highly reduced and consequently led to a decrease in the number of fish species in the river as well as fish landings. Moreover, further research revealed that the exposure of juvenile rainbow trout fish species resulted in a 100% mortality rate after 65 days due to copper concentrations between 0.008 - 8.0 mg/l. This range falls within the 5mg/l concentration of copper discharged into the water systems by mining companies. If not carefully monitored, the probable risk of extinction of the aquatic life in the river could be realized.

3.1.3. Canada and Southeast Alaska

More than 50 percent of US seafood is produced by Alaska, known as the "jewel of the world in fisheries management," (Fitzgerald, 2015). This is

attributed to the fact that dams cannot be seen on the rivers as well as the development of watersheds that will have a negative impact. Salmon is the dominant fish of southeast Alaska, which accounts for 75 percent of the region's seafood economy. Chum, Pinks, Coho, Sockeye and Kings are the five different salmon species that swim upriver to spawn. The salmon life cycle is ends with each fish finding its way back from the open ocean to the freshwater stream where it was born. However, this cycle was disrupted in one of the biggest sockeye rivers in North America.

In August 2014, a dam holding back wastewater from the Mt. Polley copper and gold mine in British Columbia burst, and more than six billion gallons of polluted water and mine waste flowed into the Fraser River just as the fish had begun the journey upstream. The water contained heavy metals such as zinc, arsenic, mercury, lead, selenium, cadmium and others. This sudden discharge of waste wiped out several kilometers of Hazeltine Creek and eventually poured into Quesnel Lake, one of the largest nurseries of sockeye salmon in British Columbia. Quesnel Lake also served as a vital rearing area for the salmon that spawned in the Fraser River, the longest river in British Columbia. Years after, it was estimated that the incident destroyed one-quarter of sockeye salmon due to the heavy metals deposited in the lake, which have been taken up in the water column and the food chain (Wilderness Committee, 2016).

Said catastrophe may indicate a growing conflict between Canadian mining businesses and the Alaskan salmon industry. Since British Columbia is in the midst of a mining boom, most of its metal mines are placed along rivers that ultimately flow into Southeast Alaska, such as the Unuk, the Taku, and the Stikine. All mines create massive amounts of toxic mining waste that will need to be stored and kept out of rivers since these are all in very close proximity to major salmon streams located in remote but very geologically unstable and wet environments.

The foreseen impacts of mine development in the river areas have become a concern for many people, particularly in the town of Wrangell, which attributes its growth and development to the bounty of the Stikine river. Though many still fish mostly for subsistence, commercial fishing remains the biggest industry in Wrangell, and residents fear that mining companies threaten the river at the center of the town's fishing economy. Over the years, Alaskans were able to overcome the impacts of timber, oil and mineral extraction, carefully striking a balance in managing different natural resources. However, in the case of salmon, advocates argue that fish are different since they are a renewable resource. As long as the fishery is regulated and their habitat is kept healthy, the sockeye, humpies and kings will keep coming back to the rivers and streams of Southeast Alaska every summer. In this regard, the best way to help Salmon fisherfolk is to keep the rivers running clean and free. This can only be achieved if all concerned citizens work together in protecting these abundant river resources.

3.1.4. Punta de Choros, Northern Chile

In Northern Chile, a fishing village of some 900 fishermen was reported to fight the Dominga iron mine port mining project (Milesi, 2017). Punta de Choros is a hidden cove on Chile's Pacific coast and is considered a natural heritage that calls for respect for fishers and tourist operators that make a living out of this natural resource through the spectacular beaches, whale watching and traditional seafood cuisine. It has positioned itself one of the most attractive destinations for beach buffs with its turquoise-colored waters and white sands set in the Region of Coquimbo. With its warm climate and a privileged location in close proximity to different species of marine fauna, such as dolphins, penguins, sea lions and even whales, this place is an excellent haven for beach and nature lovers.

The Dominga project is expected to yield positive effects such as the generation of 9,800 jobs in the community and at the same time allow the extraction of 12 million tons a year of iron concentrate and 150,000 tons of copper concentrate. Moreover, the mining project further caused a division in the community between those who make a living from

fishing and tourism versus those who live in the foothills of the Andes mountains.

On the other hand, the local fisherfolk foresee how the project would affect several natural reserves, such as the effects from the traffic of cargo ships and a desalination plant, which could possibly harm one of the world's top 36 biodiversity hotspots. In fact, proceeding with the mining project would translate to 100 tons of tailings with chemical compounds in bodies of water in order to obtain a ton of iron ore that fetches only 52 dollars. Conversley, harvesting one ton of clams would be equivalent to 1.5 million dollars, as long as its habitat is preserved and protected.

Despite the stated negative consequences of pursuing the said project, the agreement between government and the Dominga project has been signed, which states that the Dominga project will improve the productive sectors, and when the mine closes down, greater development in activities like agriculture, sheepherding and fishing could be achieved by the country. Nevertheless, this remains to be seen and assessed as the project impacts one of the world's most important nature reserves and the habitat of dozens of species.

Aside from the above-mentioned country cases, Bacsujlaky (2004) made a compilation of modern mines that damaged rivers & fisheries. These incidences pertain to the following: Baia Mare Gold Mine In Romania, Summitville Gold Mine In Colorado, Gilt Edge Mine in South Dakota, Grouse Creek Mine in Idaho, and Molycorp Molybdenum Mine in New Mexico. Such mining operations in these locations made use of the main components that were considered "state-of-the-art", using modern hardrock mining technology in their establishment. The leakages and dam failures causing both short and long-term damage to aquatic resources are not examples of isolated, unusual accidents, but could be considered common features of hardrock mines with large tailing impoundments and dams. Such accidents and/or chronic leaks only vary in level of severity and the duration of the impact on aquatic resources and public health. Nevertheless, all cases were evident of contaminants from the hardrock mining process that cause pollution despite such mining operations being subjected to extensive engineering design and environmental review procedures conducted by both local and federal governmental bodies. Furthermore, water pollution occurred in both ground and surface waters, which involved the release of cyanide, heavy metals and acid generated from mine waste.

3.2. Integrated Analysis

In the accounts of mining incidents for each country, engaging in mining posed an opportunity for progress and development; high resource potential, employment generation, and export trade exchange, among others. All these foreseen advantages made it a promising venture not just for the private sector and investors but also even for the government. The success of a mining opportunity is envisioned as one of the drivers of the economy that further lead to the growth and development of the locality. In fact, a many areas have shown a tremendous change in physical and infrastructure development in the area of the establishment of a mining plant or facility. On the other hand, failure of any mining project is always expected to lead to catastrophic consequences in various proportions depending on the magnitude of failure and its scope of harm.

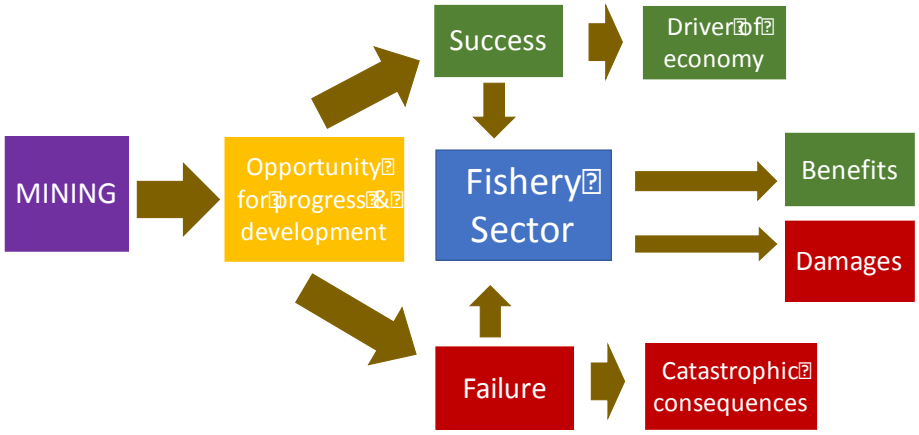
In the case of the fishery sector, mining may not have a direct effect on the bodies of water, unless it is sea mining. In fact, the success or failure of any mining project has always been two-pronged since it is never a win-win situation in the context of the fishery sector. In any case, literature has indicated the benefits or damages that mining could have against the fishery sector, depending on the support mechanisms, policies and officials that approve and govern the mining operations.

Furthermore, research has shown that despite prudent measures in the implementation of mining operations, the long-term implications of mining on the flora and fauna underneath the rivers and coasts could eventually come into close contact with leaks and seepages that are released by mining facilities. The rich

biodiversity seem to have a "scent" that indicates harmful chemicals are just within rich. Earning warning signals could be sensed by aquatic species since these are their native habitats.

It is in this respect that policies, compliances and sustainability programs have to be taken seriously if mining is to go hand in hand with the natural environment. Mining may promise to have the capacity to generate and provide stakeholders a comfortable way of living through gaining access to physical and financial resources. However, such comfort comes with a price that unfortunately the present generation could not afford to pay. It would be a nightmare to see that all the hardwork, dedication, perseverance, and sacrifices made by the present generation not even be tantamount to allow future generations to experience this natural heritage. With mining under scrutiny, one can never go wrong in making his or her choice to ensure that coming generations have a bright future ahead. As whole, the integrated analysis is depicted in Figure 3, which is the conceptual framework for the mining and the fishery sectors.

Fig. 3. Conceptual Framework for the Mining and Fishery Sectors



IV. Summary and Conclusion

The study is an attempt to showcase the impacts of mining on the global fishery sector. In general, it has been a common factor among the various national fishery sectors to hit rock bottom when mining disasters came. Each fishery sector was taking care of its natural heritage biodiversity, considered indigenous and endangered species in the affected river or coastal area. This just goes to show that bodies of water holding or containing such fauna should be considered protected natural environments. This is where a question of integrity on the part of policy makers and law makers comes into play if they indeed did what was called for in the interests of protecting these water sanctuaries.

V. Recommendations

The selected country cases call for action-based recommendations that can eventually revitalize the life of a river and coastal waters. Research has reported that time will indeed be an important element as the mining disaster's consequences entail several decades before it could eventually be "flushed out" of the aquatic ecosystems. Literature suggests these recommended remedial measures given below to initially address the condition of these bodies of water that were affected by mine spills:

5.1. Cleaning a River after a Mine Spill

According to Pappas (2015), cleaning the river after a mine spill is a twofold task: treatment and dilution.

5.1.1. Treatment

Build a cement bulkhead to plug the leak, with pipes that would allow the slow release and treatment of water. The mine water is toxic because it contains dissolved pyrite, or iron sulfide, better known as fool's gold. The combination of iron sulfide, water and oxygen results in the formation of sulfuric acid. Creating mine acid drainage has been identified as a mine remediation technique.

The Environmental Protection Agency (EPA) emergency clean-up is a quick version of typical mine treatment. According to news releases, the agency has excavated four holding ponds below the mine breach. Crews are treating the water in these ponds with caustic soda (sodium hydroxide) and lime (calcium oxide), which are very basic in pH. The goal is to reduce the acidity of the water. After the said treatment, the EPA reported that the water released from its treatment ponds was cleaner and less acidic than the water in Cement Creek had been even before the spill.

5.1.2. Dilution and time

The EPA and other agencies are monitoring wildlife and testing water quality downstream from the mine, all the way to main bodies of water. This is where dilution and time will likely go a long way toward mitigating the long-term consequences of the spill.

As the contaminated water flows into larger and larger bodies of water, it will become increasingly diluted. However, that dilution does not negate the ongoing challenges caused by abandoned mines, which tend to wreak environmental havoc on their own. Many leak constantly at low levels, or release toxic waste during the spring melt each year, and others occasionally output large pulses of contamination. Nevertheless, time is a factor for this dilution to eventually take effect.

5.2. Modern Mitigation Techniques for Waste Rock Disposal

According to the National Academy of Sciences (2012), modern mitigation techniques for waste rock disposal include (1) careful siting of waste rock piles and construction of drainage ditches to facilitate collection of leachates; (2) isolation and burial of waste rock with high potential for contamination in low permeability strata to minimize interactions with water and air; and (3) if permitted, chemical treatment of drainage water collected from waste rock piles. During decommissioning, soil covers can be used to control infiltration and production of leachate from waste rock piles.

5.3. Policy Recommendations and Reforms

A comprehensive policy program that not only serves the mining companies but all stakeholders involved so there is a clarity of roles, levelling of expectations, and hort-and long-term sustainability plans to further support any mining venture should be put in place. This should also be in line with what the government's strategic development plans, particularly for environment sustainability.

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Employer Perceptions on Relevant Competencies and Career Readiness of Entry-Level College Graduate Employees in Selected Agribusiness Enterprises and Support Institutions in Laguna, Philippines

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ABSTRACT

With agribusiness as one of the five priority areas of today's government (Romualdez, 2017), identifying the competency needs of the industry and developing a matching workforce is important for development. However, few similar studies regarding agribusiness competencies have been done in a Philippine setting. Thus, this study provided insights on employer perceptions on relevant competencies and career readiness of entry-level college graduate employees participating in agribusiness/support institutions in Laguna, Philippines. Non-random sampling was conducted depending on the availability of employer-respondents. A list of agribusiness-related enterprises and support institutions was collated from primary data (list provided by local government units and site visits of select areas in the province of Laguna, Philippines) and secondary data (web searches and referrals). Out of the 94 contacted, a total of 51 employers in Laguna province (41 businesses and 10 institutions) participated in the study, primarily through self-administered questionnaires. Fifty-two entry-level employees in different job fields were grouped by degree and university for analysis. Twenty-two competencies derived by Miller et al. (2005) from previous studies were used for the evaluation. A Likert-scale was used to express an employer's perceived level of importance, expectation, and performance for the competencies. Descriptive statistics such as median, quartile and interquartile ranges, cross-tabulations, chi-square test of association, and Cramer's V for strength of association were used to analyze the given ratings. Findings revealed that communication-based competencies and technical competencies (agriculture/business-specific knowledges) remain the top relevant competencies in agribusiness. External factors are associated with the emergence of new competencies (such as globalization and computer technology-related skills) becoming increasingly important in agribusiness. Entry-level college graduates were mostly rated to be proficient and career ready; however, there are competencies such as negotiation (N-UPLB graduates with ABM degree) and interdependence of business functions (UPLB graduates with N-ABM degree) where further training is needed. Thus, students and professors of educational institutions may have to align their learning and teaching, respectively, in order to address lacking or underdeveloped competencies for better employability.

Keywords: career readiness, college graduates, competencies, employer perceptions, Philippines
JEL Classifications: J24, M51, O15

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I. Introduction/background

A workforce's competencies are important in agribusiness as they provides a competitive advantage a business has over other players (Noe, Hollenbeck, Gerhart, & Wright, 2000). Competencies indicate the capacity of the workforce to accomplish tasks for the business, thus contributing to the overall achievement of business goals.

Competencies and skills needed in agribusiness change as a response to a change in the agribusiness environment. Previous studies have different claims on the upcoming relevant competencies (Noel & Qenani, 2013). In those studies, differences could be attributed to the variables taken into consideration in the study. Litzenberg and Schneider (1987) considered the business' industry and concluded that relevant competencies vary per industry. The nature of an employer's work (i.e. management level) also contributes to resulting relevant competencies (Litzenberg & Schneider, 1987).

Amidst different claims, previous studies have agreed on interpersonal and communication skills as an important competency in agribusiness (Cabardo & Madamba, 2014; Litzenberg & Schneider, 1987; Miller, Davis, Ferreira, Fredendall & Nilson, 2005 and Vreyens & Shaker, 2005). However, competencies like interpersonal and communication skills were low on demonstration and preparedness, as perceived by both employers and college-graduates themselves (Miller et al., 2005; Vreyens & Shaker, 2005).

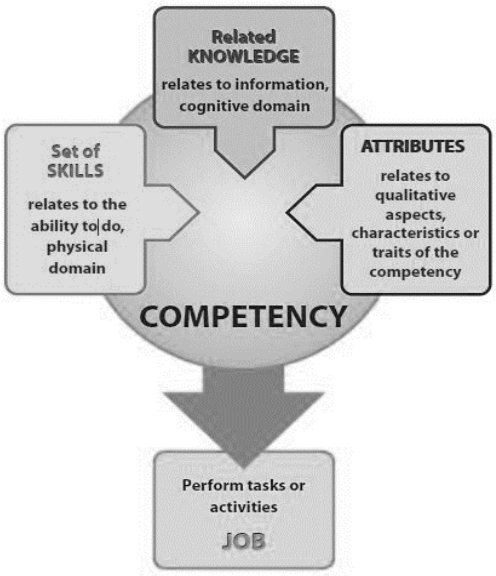
Much of what has been learned on relevant agribusiness competencies comes from studies done in foreign countries. As stated by Litzenberg and Schneider (1987), competencies changes in relation to the agribusiness environment. Considering the business environment in the Philippines and the widespread influence of globalization and use of technology, competencies that would be relevant today may be different from previous studies.

Knowing where we stand today is important in aligning our actions are be able to reach the goals of tomorrow. Identifying the state of the agribusiness workforce and the competencies needed by the industry is important for understanding the areas of training in agribusiness which could further be developed. With agribusiness as one of the five priority areas of today's government (Romualdez, 2017), studies related to the industry should be timely to help in development and explore prospects. However, few similar studies regarding agribusiness competencies have been done in a Philippine setting. Thus, in this study, the researchers aim to gain insights into the relevant competencies in agribusiness as well as assess the performance of college graduate employees in entry-level jobs as evaluated by employers in select agribusiness enterprises and support institutions in Laguna, Philippines.

II. Literature Review

Competencies, as defined by the United Nations Industrial Development Organization, or UNIDO (2002), are a set of skills, related knowledge and attributes that allow an individual to perform a task or an activity within a specific function or job. It is also the ability to put knowledge to use. (Boyatzis, 2009; Vreyens & Shaker, 2005). Different terms have been used synonymously with the term "competencies", but each can be defined based on the term's scope. Knowledge is in the cognitive domain often linked to educational background. Skills relates to the physical domain that can be harnessed during learning years. Attributes, on the other hand, are the qualitative aspects of the competency with examples that are behavioral (UNIDO, 2002). Abilities, like skills, are qualities of being able to do something (Lauby, 2013). The difference between abilities and skills is that abilities are something natural and innate as compared to skills, which are learned behaviors (Staff Squared, 2015). Competencies encompass all these terms. This is reflected in the Model of Competency by UNIDO (2002) (Fig. 1), which was primarily used for this study's definition of competency.

Fig. 1. UNIDO (2002) Competency Model



Past agribusiness studies have used competencies to identify skills gaps (Miller et al., 2005; Vreyens & Shaker, 2005), assess the job preparedness of graduates (Cabardo & Madamba, 2014), or analyze it to recommend ways to adapt curriculum to meet the demands of the job market (Litzenberg & Schneider, 1987; Vreyens & Shaker, 2005). Miller et al. (2005) conducted a nationwide survey on agribusiness firms to assess the competencies of entry-level college-graduate employees. The list of Knowledge, Skills, Abilities, and Traits (KSAT) used were obtained from the analysis of Miller et al. (2005) from previous studies by Litzenberg and Schneider (1987), Broder and Houston (1984), Klein, Andelt et al., Suvedi and Heyboer, and other university assessments regarding competencies of entry-level graduates in agribusiness. From their analysis of previous studies, it was found that communication and interpersonal skills, although rated as more important employee KSATs than "subject matter" skills, are weak areas of the graduates (Miller et al., 2005). Similarly, studies on the competencies of entry-level employees in agribusiness have shown that the same important competencies were sought by the employers (Broder & Houston, 1984; Spotanski & Foster, 1989). The competencies formed from previous literature analysis are shown in Table 1.

However, changes in the business environment could influence the competencies needed in agribusiness. (OECD, 2011, as cited in Noel & Qenani, 2013). Through choice experiments of hiring, it was found that creativity and critical thinking are becoming important in agribusiness (Noel & Qenani, 2013). With the continuous development of technology and the entrance of technologically-attuned generations to the workforce, expectations on technological competencies could also be expected from upcoming entry-level workers (PwC, 2017). Additionally, the surge of globalization, in which the flow of goods are growing in the global market, also plays a role.

Table 1. Competencies and Definitions

Competencies	Definition
C1. Leadership	Ability to be a good leader
C2. Public speaking	Ability to speak effectively to groups
C3. Listening	Ability to listen well
C4. Relating to Different People	Ability to relate well to many different kinds of people, including non-Filipinos
C5. Basic Business Practice Understanding	Understanding of basic business principles
C6. Problem Solving	Ability to use the right tools in solving business and work problems
C7. Decision-making	Ability to use good decision-making techniques in solving problems
C8. Risk Management	Ability to make decisions in the face of incomplete information and risk
C9. Negotiation	Ability to negotiate
C10. Computer Technology	Ability to use computer technology (e.g., spreadsheets, databases, multimedia)
C11. Understanding of International Cultures	Knowledge of the cultural and economic differences in international business
C12. Business Ethics	Knowledge of business ethics
C13. Personal Ethics	Ethical behavior on a personal level (e.g., work ethic, fairness with others)
C14. Understanding of a Market-based Economy	Understanding of how the economy works
C15. Globalization	Understanding of the global nature of business today
C16. Understanding of the Interdependence of Business Functions	Understanding of the interdependence of business functions/departments
C17.Teamwork	Ability to work effectively and efficiently on a work team
C18. Conflict Resolution	Ability to resolve conflict with members of a work team
C19. Enthusiasm	Enthusiasm
C20. Self-confidence	Self-confidence
C21. Initiative	Initiative
C22. Professionalism	Professionalism

Source: Miller et al. (2005).

In order to determine if the competencies are still in line with what is produced for the agribusiness industry, career readiness was assessed. Career readiness was defined as "the attainment and demonstration of requisite competencies that broadly prepare college graduates for a successful transition into the workplace" (National Association of Colleges and Employers, 2017). This means that the expectations of employers and the relevant competencies are sufficiently met by the employees. These requisite competencies include: critical thinking/problem solving, oral/written communications, teamwork/collaboration, digital technology, leadership, professionalism/work ethic, career management, and global/intercultural fluency (NACE, 2017). Technical competencies vary depending on the specialized field of work (UNIDO, 2002).

To measure career readiness, sample assessments from the National Association of Colleges and Employers [NACE] (2017) and previous studies used a mixture of scalar tools and open questions. In a study by Miller et al. (2005), a five-point Likert scale (5 =highest, 1= lowest) for the assessment of competency as used. Scaling was done in order to allow the individual to express how much they found a competency important (McLeod, 2008).

In determining relevant competencies and career readiness, employers were chosen as the main source of information. As defined, employers are "legal entities that control and direct a servant or worker

under an express or implied contract of employment and pay him or her salary or wages in compensation" (WebFinance Inc., 2017) This includes the supervisors and/or managers of businesses or organizations within the agribusiness sector. Both were considered to evaluate entry-level employees since both have the knowledge and credibility to see through the work of their subordinates and the workload assigned to each.

III. Methodology

A list of companies and support institutions were collated from primary data (list provided by local government units and site visits of select areas in Laguna) and secondary data (web searches and referrals). A total of 159 companies and support institutions were listed. The list was narrowed down to those still operating, and this included only 126 companies/support institutions. Out of the 126 companies/support institutions, only 94 were contacted by the researchers due to limited time and financial resources. From those contacted, 66 responded as follows: 15 declined to participate in the study and 51 participated in the study. Of the 51 participants, 41 were businesses while 10 were support institutions.

An analytical framework of the study was developped based on the tested constructs of previous literature. Profile features considered in the study were based on a study by Litzenberg and Schneider (1987) for the consideration of industries on the resulting relevant competencies, and on the study by Cabardo and Madamba (2014) for the employer profile's demographics (gender) which would be considered in analyzing the perceptions of the respondent. Information on entry-level employees per company/support institutions were divided into groups based upon whether they were University of the Philippines Los Baños (UPLB) graduates or not (N-UPLB). The groupings were further classified as to whether the employees had agribusiness management degrees (ABM) or not (N-ABM). All in all, four sub-groups were considered in the study: UPLB graduates with agribusiness management degree (UPLB-ABM), UPLB graduates with non-agribusiness management (UPLB-N-ABM), non-UPLB graduates with agribusiness management degree (N-UPLB-ABM), and non-UPLB graduates with non-agribusiness management degree (N-UPLB, N-ABM). The employers were then asked to evaluate entry-level employees by sub-group (if applicable).

The competencies assessed were sourced from the 22 competencies of Miller et al. (2005). These competencies were collated from the study of previous literature on resulting competencies that are relevant in agribusiness. Other questions used in this study concentrated on agribusiness. A Likert-scale was used to measure the level of competency, and this was based on UNIDO's competency evaluation (Table 2). As for the level of importance, a 5-point Likert scale was constructed with the points based on McLeod's (2008) definition of the Likert scale.

Table 2. Levels of Competency by UNIDO (2002)

Level of Competency		
Advanced	**Proficient**	**Knowledgeable**
- Demonstrates high level of understanding of the particular competency - Can perform fully and independently related tasks Work activities are carried out consistently with high quality standards Frequently demonstrates application that indicates profound level of expertise	Demonstrates a sound level of understanding of the particular competency to adequately perform related tasks, practically without guidance Work activities are performed effectively within quality standards.	Demonstrates a sufficient understanding of the particular competency to be used in the work place but requires guidance Tasks or work activities are generally carried out under direction

Source: United Nation Industrial Development Organization (2002).

Descriptive statistics were used to analyze the gathered data. Cross tabulations were done to describe the responding sample. Analyzing the evaluation using the Likert-scale, the median was used to measure the central tendency since it helps identify the point of the scale where most response is and is not affected when the most common response is an outlier. The median was used to compare relevant competencies and the employees' levels of competency.

To measure the dispersion of responses in the sample, the interquartile range (IQR) and quartiles (Q1, Q3) were used. These measures reflect the dispersion of the employers' responses from the median. The IQR is the difference between Q1 and Q3. For interpretation, "a relatively small IQR indicates a consensus while a large IQR indicates a polarized response" (Kostoulas, 2014). A competency with a polarized response may mean that the employers hold strong opinions for/against the competency's importance or their employees' shown level of performance. The quartiles, Q1 and Q3, which separate the 25% lowest ratings and 25% highest ratings respectively, are then used to show the distance from the median.

Differences in performance per entry-level employee sub-groups were compared using the resulting medians, IQR, and quartiles. Career readiness of agribusiness management graduates were identified by comparing the median of the employer's expected level of competency for an ABM graduate to the median of the shown level of competency of employees with ABM degrees.

In analyzing an employer's perception, the premise of the study was that the resulting important competencies were not significantly associated with the shown level of performance of entry-level employees. Using the Chi-square test of association, the decision criterion was to reject the null hypothesis if the resulting test statistics were less than the critical values (Turner, 2014). Cramer's V was used to test the strength of association to determine whether it was weak (<0.10), moderate (0.10-0.30), or strong (>0.30) (Statistical Solution, 2017). Strong significant association means that the employers' perceived importance on a given competency is strongly associated with the actual performance of current entry-level employees in agribusiness. On the other hand, strong but insignificant associations could mean that other external factors could be attributed to the employers' perceived importance of a competency. Factors such as external trends and business profiles related to the competency for the resulting association were analyzed to trace possible causes.

IV. Results and Discussion

4.1. Employer Perceptions on Relevant Competencies

Analyzing employer perceptions on relevant competencies, it was found that leadership, relating to different kinds of people, teamwork, initiative, and professionalism are unanimously (IQR=0) very important (Median = 5) (Table III**).** On the other hand, competencies such as globalization and understanding of international cultures had low ratings and more dispersed opinions (IQR=2) as compared to others.

Competencies that were relevant were mostly communication-based (leadership, relating to different kinds of people, and teamwork). Looking further into agribusinesses/support institutions' ownership type (government or private) and establishment type (business or institution), similar sets of competencies were observed among employers in government and institutions, and those employers in private and business institutions. This is because most of the participating employers in support institutions are government workers. Employers from the two groups (government/institution and private/business) both value communication-based competencies, but the competency mix varies.

Employers in government/institutions favor competencies such as teamwork and professionalism. Since their line of work is inclined to be service-oriented, knowing how to work with other people is very important for public service. On the other hand, employers in private/business institutions favor a

competency mix which is organizational in nature, such as relating to different kinds of people, problem solving, risk management, teamwork, initiative, and professionalism.

Among the competencies, it was stated that globalization and understanding of international cultures had the lowest ratings and the most dispersed opinions among the competencies. Analyzing the dispersion from globalization, the study showed that most participants in wholesale and retail trade perceived globalization to be important (IQR=0.5). The increasing trade of goods in the international market hastened the flow of goods in and out of the Philippines. Its influence in the market would be mostly felt by those in the wholesale and retail industry. Thus, the importance given by the employers to globalization is a response to this trend.

Another competency related to globalization is the understanding of international cultures. Further analyzing firm size and industry, employers in large food and services activities had a consensus (IQR=0) on the competency being important (Median=4). It was also observed that employers in large and medium agribusinesses gave higher ratings than those in small and micro businesses. Large and medium agribusinesses are most likely to engage in global scales of operation given they have the capacity to do so. Thus, this leads to the importance given to understanding of international cultures.

Table 3. Average Level of Importance Given per Competency

Items	Score			
Leadership (C1)	5	5	5	0
Public Speaking (C2)	4	4	5	1
Listening (C3)	4	5	5	1
Relating to Different Kinds of People (C4)	5	5	5	0
Basic Business Practice Understanding (C5)	4	5	5	1
Problem Solving (C6)	4	5	5	1
Decision-making (C7)	4	5	5	1
Risk Management (C8)	4	5	5	1
Negotiation (C9)	4	5	5	1
Computer Technology (C10)	4	4	5	1
Understanding of International Cultures (C11)	2	4	4	2
Business Ethics (C12)	4	5	5	1
Personal Ethics (C13)	4	5	5	1
Understanding of a Market-based Economy (C14)	4	4	5	1
Globalization (C15)	3	4	5	2
Interdependence of Business Functions (C16)	4	4	5	1
Teamwork (C17)	5	5	5	0
Conflict Resolution (C18)	4	5	5	1
Enthusiasm (C19)	4	5	5	1
Self-confidence (C20)	4	5	5	1
Initiative (C21)	5	5	5	0
Professionalism (C22)	5	5	5	0

Notes: 1. For the assessment of importance, the scale is (median, Q1, and Q3): 1 = unimportant, 2 = of little importance, 3 = moderately important, 4 = important, 5 = very important

2. For the dispersion of responses, the scale is: 0= consensus, the higher the value the polarized are the opinions.

4.2. Employer Perception on Career Readiness

In order to determine entry-level college graduate employee career readiness, employers were asked for their expected level of competency for an ABM graduate beforehand. Results showed that, on average, employers expected a proficient level of competency from ABM graduates. They have a lower expected level for globalization and understanding of different cultures, similar to its low importance rating. In terms of consensus, employers had different expectations for ABM graduate level of competency for problem solving. This could be attributed to the fact that not all employers were aware of the ABM coursework being inquired about. Thus, knowledge on the abilities and training these graduates may have is limited to what they know and understand of agribusiness management.

Different behavior expectations were observed when the employers were grouped by gender. Female employers gave a higher expected level for communication-based competencies, such as relating to different kinds of people, than male employers. On the other hand, male employers have a greater tendency to give lower expectations for competencies than female employers. For competencies such as decision-making, risk management, personal ethics and conflict resolution, female employers held different expectation levels while male employers held a greater consensus.

In relation to this, in a study by Pfaff (2017) testing the conventional wisdom that female managers were good at communication skills, it was found that female managers were better than their counterparts for "soft skills" such as communication, teamwork, feedback, and empowerment. Male employers were more inclined to "technical skills" as their forte. Analyzing the employer's expectations, it can be said that the employers tend to have higher expectations for competencies which are aligned with their "gender strengths". Still, development of the opposite gender's strengths is possible (Pfaff, 2017), thus the expected ratings among the employers were similar.

Moving on to employer evaluations, fifty-two college graduates were evaluated. By university, an equal proportion was observed between UPLB and N-UPLB. By college degree, a majority of the employers evaluated N-ABM employees (N=45) rather than ABM graduates (N=7). Overall, college-graduate employees were assessed to be roficient in 18 competencies and Knowledgeable in the remaining four. Competencies in which the employees were evaluated to be Proficient were leadership, public speaking, listening, relating to different kinds of people, basic business practice understanding, problem-solving, decision-making, risk management, negotiation, computer technology literacy, business and personal ethics, teamwork, conflict resolution, enthusiasm, self-confidence, initiative, and professionalism.

Given that the evaluated employees were entry-level college graduates, a Proficient level of competency was expected. Employers perceive this level to be needed for orientation and training in order to help the new employee adjust to the working environment. However, given that the employees were college graduates, autonomy in showing these competencies was also expected since they assume that a sufficient level of competency was already developed during education.

Competencies which employers gave a low rating in comparison to other competencies were: understanding of international cultures, understanding of the market-based economy, globalization, and interdependence of business functions. For these competencies, employers rated college graduates to be "knowledgeable" (Median=1). Assessed by university, UPLB and N-UPLB graduates had "knowledgeable" ratings for globalization and understanding of a market-based economy (Median=1, IQR=1). Not much difference was seen in the range of assessments. However, for understanding of international cultures and interdependence of business function, college-degree graduates from N-UPLB were given a more congruent "knowledgeable" rating for the said competencies while UPLB were given higher range of performance ratings.

Comparing the performance ratings by college degree, agribusiness management graduates and non-agribusiness management graduates performed relatively the same in four out of the 22 competencies. Both were rated to be Proficient in competencies such as problem solving, decision-making, risk management, and business ethics. In terms of consensus, ABM graduates were observed to have more similar performance ratings for basic business practice understanding and understanding of a market-based economy, while a higher range of performance ratings for computer technology, interdependence of business functions and enthusiasm was observed.

Nevertheless, interviewed employers have expressed that learning continues even at work. The level of competency of employees could still be molded into the ways of the business/institution through training, orientations, and supervision of the employee's work.

Comparing the employers' expectations with that of their evaluations, most of the expectations for competency were met (Difference in Median=0) except for understanding of a market-based economy and interdependence of business functions (Difference in Median=1). On the average, a Proficient level of competency was expected. However, the given shown level of the college graduates was Knowledgeable.

The study further looked into the career readiness of entry-level employees per university and per college degree. It was found that N-UPLB graduates with ABM degrees were lacking in negotiation while UPLB graduates with N-ABM degrees were lacking in terms of knowledge on the interdependence of business functions.

Although UPLB graduates with ABM degrees met expectations and were analyzed to be career ready, they were scarcely observed in the study's agribusiness workforce. In the study of Cabardo and Madamba (2014), it was found that the majority of ABM-UPLB graduates go into business fields, but not necessarily into agriculture. Thus, motivation to go into agriculture business should therefore be cultivated in students, especially those pursuing an ABM degree. Suggested ways to address this is through student immersion in the field of agribusiness, in line with those that were also sought by the ABM-UPLB graduates themselves (Cabarado & Madamba, 2014).

4.3. Analysis of Employer Perceptions

Analyzing employer assessments, it was found that the nature of work and level of the employee's job influenced the employer's given ratings. A strong and significant association was observed for *public speaking* and *negotiation*. The case for public speaking showed that a competency's importance is relative to its applicability and use in the workplace. This was exemplified by the analysis of important competencies per ownership type (government/private) and establishment type (business/institution). All categories in each type showed similar relevant competencies (communication-based competencies). The difference is in the type of competency they favor. For private business institutions, they prioritized organizational skills (i.e. leadership), and government institutions prioritized public-service skills (i.e. teamwork). On the other hand, the case for negotiations revealed that some competencies in agribusiness are acquired through experience and exposure to the agribusiness field.

For insignificant but strong associations, these relationships were observed for competencies relating to computer technology, understanding of international cultures, and globalization. The presence of this relationship indicates that external factors such as information technology use and globalization are becoming more relevant in today's agribusiness workplace. Specifically, large firms in agribusiness (those in the wholesale and retail trade, and those in the administrative and support activities for agribusiness) deemed globalization-based competencies and technology-based competencies important.

Other than the given list of competencies, employyers have frequently expressed the importance of technical competencies. Analyzing the pattern of their response, technical competencies given do indicate differences in competencies among industries (Litzenberg & Schneider, 1987). For businesses, those

in food services value good manufacturing practices to maintain sanitation in preparation procedures, those in manufacturing value the ability to use computer software for tracking production operations and inventory, those in agriculture pay particular attention to technical knowledge in farm management and farm production, and those in wholesale and retail value social media management and the of use of e-commerce. For institutions, those in administrative and support services values marketing skills, those in financial services favor computational skills and licensed accountants, and those in professional and scientific activities value highly specialized competencies.

V. Conclusion and Implication

This study showed that communication-based and technical competencies remain the most relevant competencies in agribusiness from the employer perspective. Relevant competencies by industry do vary as exemplified by the different mixes of technical competencies cited per industry. As stated by employers, it is important to know the field you are entering. Studies or courses which could provide students specialized knowledge in the field of agribusiness are therefore advisable.

Among these competencies, upcoming relevant competencies were observed as a response to economic and cultural trends. The widespread use of technology and its integration into business processes, along with globalization, fueled the emergence of globalization-based competencies and technology-based competencies. Although not completely of utmost importance, strong relationships between the employers perceived importance and the employers' evaluation of performance indicates the growing applicability of these competencies. Thus, investing in teaching students about using software systems for business processes and integrating global perspectives into teaching, especially in the business field, will help the students adapt in this era.

In assessing the performance of college graduates, it was found that although college graduates were mostly career ready, there were competencies such as negotiation (N-UPLB graduates with ABM degree) and interdependence of business functions (UPLB graduates with N-ABM degree) in which further training is needed. The demonstration of negotiation competency, in particular, was found to have a strong significant relation to the importance given by the employer. It is a skill in agribusiness found to be important, but it was given a low rating due to lack of experience. This indicates a competency that is learned by practice. Thus, activities in which students could harness negotiation skills are advisable. Exposure to actual field events would be even better since it would teach the students the actual handling of negotiations in agribusiness. As for interdependence of business functions, this could indicate that N-ABM degree graduates of UPLB would benefit from receiving classes which could teach them the interrelation of the agribusiness system.

It could also be noted that ABM degree graduates of UPLB students were career ready, but were scarcely observed in the agribusiness workforce. From the study of Cabardo and Madamba, (2014), it was found that although these graduates were in business fields, they were not necessarily in agriculture-related business fields. Thus, motivation for graduating students to go into agriculture should be cultivated. Suggested ways to address this is through immersing the students either in the corporate or agriculture field of agribusiness. In this way, they may get to know the area they are in.

However, regardless of these findings, the results may only hold true for the sample respondents. Non-random sampling was done to exhaust all possible respondents since the study is limited to the willingness and responsiveness of the respondents. Though not representing agribusiness in Laguna as a whole, the analysis provided an insight into some of the employers' perception in agribusiness. A random wider scope of sampling may be advised for future studies in order to gain a better perspective of the

agribusiness workforce. Small businesses were also prevalent in the population of respondents. Thus, studies on other cities (i.e. Manila, where most main offices are located) are suggested.

The study also asked for employer evaluations for college-graduates in entry-level jobs. Different competency assessments may hold for higher positions as observed by Litzenberg and Schneider (1987). Furthermore, the definitions of the list of competencies were subjected to the personal interpretations of the employers. However, the levels were clearly explained. For expectations, employers were not given a background view of what ABM is, and this is therefore subjected to the perceptions of employers on what ABM is. Similarly, career readiness was performed on the basis of expectations for ABM degree graduates. Further studies which cater to a wider degree range for expectations should be done in the future. In this way, human capital for agribusiness may be developed.

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