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Title: Entrepreneurial and Business Failure in Agribusiness: Evidence from an Emerging Economy

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Abstract

Entrepreneurship and new business development hold considerable promise for economic development and upward mobility, especially in emerging economies. Understanding failure of new businesses and entrepreneurship would go a long way in avoiding failure and promoting the success of new business development in emerging economies. Using qualitative data from interviews, we identified reasons for the failure of a group of entrepreneurs associated with a novel agribusiness activity in an otherwise, economically attractive market. The results of our study show that the lack of a clear understanding of the production model, the tendency to copy from each other led to the creation of the joint agency that tied the collective fate of a group of entrepreneurs together. This sort of herd mentality and behavior led to a premature closure of experimentation and individual learning that may have improved the chances of success. We discuss the policy and research implications of the paper.

1. Introduction

This research is a qualitative study of entrepreneurial and business failure in the pond-based aquaculture industry in Ghana during the period 1980-2009. The importance of entrepreneurship in developing countries cannot be overemphasized. New industry creation offers the promise of economic regeneration and may be a panacea for economic development. New firms create jobs, stimulate industrial development and growth, as well as open up chances for upward mobility by fostering economic development (Piore and Sabel, 1984). More importantly, new industries in agribusiness in developing countries may assure food security as well. For example, Kassam (2014) notes that aquaculture can contribute to food security and poverty alleviation and nutrition in developing countries if managed well. Despite that promise, the evidence shows new businesses, in general, have low survival rates (Romanelli, 1989; Freeman, Carroll and Hannah, 1983; Aldrich and Auster, 1986). New business creation is risky under the best of circumstances. In emerging and transitional economies with resource scarcity, however, this risk may be substantially magnified (Peng, 2001, Peng and Luo, 2000).

Given their importance, and promise but high failure rates, a clear understanding of the dynamics of new business creation and failure is necessary. As Cope (2011: 620) notes, failure represents a learning experience and therefore an important concept to understand in entrepreneurship. Recent research has begun to focus on failure as an important, yet understudied, aspect of the entrepreneurship process generally (DeTienne, 2010; McGrath, 1999; Sarasvathy et al., 2013) and more specifically for our present purposes, failure in agro-based businesses (Purves et al. 2015). McGrath (1999) suggests that one of the most commonly used criteria for defining failure within an organizational setting is based on the alternative uses of a firm's resources: 'failure is the termination of an initiative that has fallen short of its goals' (p.14). Using the same economic criteria, Ucbasaran et al. (2013) define business failure as 'the cessation of involvement in a venture because it has not met a minimum threshold for economic viability as stipulated by the (founding) entrepreneur' (p. 26). Gillespie and Dietz's (2009) put some context on these definitions when they note that the "locus of control for the failure is internal to the organization, even though the context for the failure may involve external influences" and occurs as a result of "actions, or negligent inaction" from managers (p. 129). A distinction can be made between firms which are forced to close because they are financially unviable businesses (insolvency) and firms which are shut down by choice as the firm does not provide sufficient return on investment (Coad, 2014), or where the assets of the firm are not worth further harvesting (Wennberg et al., 2010). This suggests that 'firm exit' captures firm failure in a very broad sense (Coad, 2014). This research explores entrepreneurial and business failure in which there was firm exit in agribusiness in a developing country.

Aquaculture, in general, is an important economic activity because it relates directly to global food security. According to the Food and Agriculture Organization (FAO, 2014), global capture fisheries are unlikely to increase production to meet population growth needs. Currently, aquaculture provides half of the global fish production and this is projected to increase to two-thirds of global fish production by 2030 (FAO, 2014). According to a 2014 World Bank Report, aquaculture – or fish farming – will provide close to two-thirds of global food fish consumption by 2030 as catches from wild capture fisheries level off and demand from an emerging global middle class, especially in China, substantially increases. The FAO (2011) estimates that 55 million people were engaged in capture fisheries and aquaculture in 2010. While global average per capita fish consumption is expected to increase by 2030, in Africa, where fish serves as the major protein source, it will decrease from 7.5 kilograms per year to 5.6 kilograms annually by 2030. This situation can be averted through increasing aquatic food production in Africa whose aquaculture is emerging with significant potential. However, the requisite infrastructure is typically not established to support rapidly growing aquaculture industries leading to marginal success and high failure at a time when aquaculture experienced a significant global expansion at the end of the 20th century, becoming one of the fastest growing sectors of animal husbandry and production during that period (Perlman & Juárez-

Rubio, 2010). This research aims to fill some of the existing gaps in our understanding of factors that contribute to entrepreneurial and business failure in agribusiness, aquaculture in particular, in an emerging country. The context of the study is the aquaculture industry in Ghana (circa 1980-2009) using a distinct production model, pond, as opposed to cage or pen, technology. Of particular interest, is an understanding of failure associated with a novel activity in a young industry (Aldrich and Fiol, 1994). The paper is organized as follows to explore the issues. In the next section, we explore the theoretical framework of the study. This is followed by a description of the research context and methodology including the sample, procedures for data collection and data analysis. A discussion of the implications of the research for practice and theory concludes the paper.

Aquaculture as a field of entrepreneurship, in general, is understudied (Evers, 2010). However, knowledge of factors affecting the organizational success and firm survival is important for agro-based businesses considering their contribution to global food security and their high failure rate in general (Purves et al. 2015). Both financial (Altman and Hotchkiss, 2006), nonfinancial (Madrid-Guijarro, Garcia-Perez-de-Lema and van Auken, 2011) and a combination of both factors have been used to explain organizational failure in agribusiness (Purves, Niblock & Sloan, 2015). Predictors of success or failure in farm and corporate agricultural businesses will become more prominent as population expansion places pressure on global food supply (Purves et al. 2015). This situation may be more important for developing countries as agriculture failure often has dire consequences for these regions. An understanding of factors that promote success in aquaculture, therefore, has both theoretical and practical importance. Although there are cases of aquaculture success in places like Asia (FAO 2015), Honduras (Martinez et al. 2004), Chile (Perlman and Juarez-Rubio, 2010), the case of aquaculture in Africa is less promising as noted earlier.

There appears to be a mixed record on aquaculture success in developing countries. While Asia and some Latin American countries seem to have made great progress, the performance of aquaculture generally across Africa has been spotty at best when compared to those two regions. A comparison of aquaculture development in Asia and Africa reveals the extent of the failure of aquaculture in Africa. According to Lazard *et al.*, (1991), African aquaculture development received some US\$72.5 million over the period 1978 to 1984, versus US\$171.3 million for Asia and the Pacific. For this less than threefold funding difference, Asian countries produce 1000 times more fish than Africa. The constraints to aquaculture development in Sub-Saharan Africa are rather well known. These include a lack of feed and seed quality and availability, cost of cage design and construction, and financing, lack of technical support for early adopters and technical know-how (Blow and Leonard 2007; Asmah 2008). Aquaculture contributes significantly to economies and household food security in many countries, most notably in Asia, but remains a marginal activity in sub-Saharan Africa (FAO 2000), despite a number of case studies demonstrating its theoretical economic viability (Martínez-Espinosa 1996, Aguilar-Manjarrez & Nath 1998). Major constraints to more profitable and productive aquaculture systems include inadequate inputs (Williams 1997) shortage of quality seed and the lack of appropriate technical advice (Lazard et al. 1991).

A greater understanding of factors that promote successful aquaculture in the African context is therefore necessary. This study is important because lessons from earlier failure may be important for the future, especially in view of the fact that the preliminary evidence shows that some of the same mistakes of the past, uncovered in the present research, are being repeated this time around as well. For example, Ayisi et al., (2016) found that almost 50% of fish farmers in one region covered by this study had no access to extension workers, a situation similar to what we found in the present study. We focus on independent firms and the entrepreneurs who owned and run their own businesses. In independent firms, it is difficult to disentangle an entrepreneur from the firm (Ucbasaran et al., 2013) as a key resource for the firm is the human capital of the entrepreneur (Alvarez and Busenitz, 2001). Thus, when conceptualizing failure in this context, both firm- and individual-level criteria are relevant.

Previous Research on Entrepreneurial Failure

Research on business and entrepreneurial failure has used a diverse theoretical approach but has generally explained causes of failure in terms of factors related to the entrepreneur's or manager's personality, education and traits, the firm's specific resources and characteristics and the environmental conditions facing the firm. Consistent with this thrust, entrepreneurial failure has been explained from: (1) population ecology of organizations (Hannan and Freeman, 1977), (2) institutional theory (Aldrich and Fiol, 1994), (3) the resource-based view (Michael and Coombs, 2008; Cooper et al., 1994); (4) threshold theory (Uchasaran et al. 2013; Gimeno et al., 1997), and (5) human capital theory (Brudel and Preisendorfer, 1992), including entrepreneurial decision-making (Amankwah-Amoah, 2015). Kheil (2016) collapses these research approaches into three main groups: the deterministic approach, voluntarist, and emotive approaches.

The deterministic approach

This approach assumes that the external environment over which the entrepreneur has no control determines business failure. This approach falls within the population ecology stream of research (Carroll and Hannan, 1989; Romanelli, 1993). This stream of research contends that organizations founded under resource scarcity, especially those that are too small at their founding suffer initial, if not a permanent liability (Aldrich and Auster, 1986). The whole "liability of newness" argument (Stinchcombe, 1965), suggests that young organizations face both external and internal organizational challenges that increase their risk for failure (Uchasaran et al. 2013; Watson and Everett 1996). The early years appear to be particularly hazardous (for example, Box 2008; Perry 2002). Hannan and Freeman (1989) suggest that tight niche packing (density at founding) and resource scarcity affect the initial mortality rate of new organizations. However, there may be some variations in mortality over time, mortality among young firms may rise and decline overtime with some organizations actually having a lower rate of mortality. For example, Swaminathan (1996) demonstrated that some new organizations founded under adverse conditions still survive, showing that the adverse conditions at founding may not similarly affect all cohorts of organizations founded at the same time. Those organizations who survive what the author calls "trial by fire" may survive initial adverse conditions and prosper. The hypothesized heterogeneity of the effect of adverse founding conditions on a cohort of firms increases when firms adapt their internal strategies to match industry conditions. Besides strategy-environment fit, mutual learning or the use of collective action can improve survival chances (Miner and Hauschild, 1995; Aldrich and Ruef, 2006). Institutional theorists further suggest that businesses operating in new industries commonly lack relevant experience which might otherwise improve their odds of survival (Baum and Ingram 1998; West and Noel 2009). Macroeconomic factors may also be predictors of failure under this approach. For example, industry type, economic climate including crisis, entry barriers, capital requirements, technological context, the degree of rivalry among competitors, and the power of suppliers and buyers seem to impact success and failure in SMEs in particular (Carmeli and Schaubroeck 2008; Watson and Everett 1999). The studies conducted so far indicate one effect of environmental conditions to be that the risk of failure increases in times of macroeconomic downturns (Box 2008; Carter and Van Auken 2006; Geroski, Mata, and Portugal 2010). The implicit assumption of this deterministic perspective is that survival is synonymous with success (Cooper et al. 1994) while mortality or failure is synonymous with failure (Wennberg, 2011). However, as Kheil (2016) points out, some underperforming firms and entrepreneurs may choose to persist while others may close because of positive reasons (DeTienne & Wennberg, 2014).

Voluntarist approach

This approach places failure at organizational, not external factors. The theories here focus on entrepreneurs as the firm's principal decision makers and therefore failure or success is attributable to the kinds of actions and decisions such entrepreneurs make (Mallahi and Wilkinson, 2004, Amankwah-

Amoah, 2015). Numerous theories including human capital theory, the resource-based view and decision-making characteristic theory explain entrepreneurial and business failure. First, human capital theory suggests that failure here may be a result of lack of entrepreneurial skills or mistakes (Cardon et al. 2011) educational level, management and professional experience of the owner or have been found to be negatively related to failure (Bruderl, Preisendorfer, and Ziegler 1992; Lussier and Halabi 2010). General human capital confers generalized knowledge on the entrepreneur, allowing them to be more “entrepreneurial” or guides them in the non-technical aspects of a new business activity (Minniti and Bygrave, 2001). The second form of human capital, industry-specific knowledge confers specialized, technical knowledge about the chosen market either product-specific or industry-specific on the entrepreneur (Minniti and Bygrave, 2001, Preisendorfer and Voss, 1990). Both general and technical knowledge may enhance an entrepreneur’s survival chances of their businesses. Second, the resource-based view (Wernefelt, 1984) perspective that firm-specific resources positively affects success has been corroborated in entrepreneurship research. A firm’s access to capital, its quality of accounting, finance, planning and marketing have been found to be critical factors in small-firm bankruptcies (Laitinen 2013; Lussier and Halabi 2010). Third, are theories that show how organizational outcomes, including failure, are a reflection of the characteristics of their decision-makers (Finkelstein and Hambrick, 1990; Rider and Negro, 2015). For example, Amankwah-Amoah (2015) contend that the cognitive and psychological attributes of the decision maker interact to contribute to business failure. Finally, institutional theorists suggest that organizations, particularly those associated with novel activities with few precedences, face a critical task of building legitimacy to access both direct and indirect support from stakeholder groups (Fichman, 1995; Aldrich and Fiol, 1995). Legitimacy opens access to needed resources, including investment capital. Organizations can build legitimacy by demonstrating that what they are doing is unique or use some socially accepted procedure for producing the good or service amongst others (Aldrich and Fiol, 1994). Such legitimacy building can be undertaken by individual organizations through deliberate strategic activities such as demonstrating the management team’s competence (Zimmerman and Zeitz, 2002), through networking (Tornikoski and Newbert, 2007) or through collective action (Aldrich, 1994). The inability to either make the right decision, get access to resources or build legitimacy becomes a source of failure (Sheppard, 2003).

The emotive approach

The emotive approach casts some doubt on the voluntarist assumption that failure is the result of the poor performance that results from a lack of resources (Khelil, 2016). The emotive approach emphasizes that psychological factors associated with the entrepreneur may be a more important predictor of failure. Using individual-level explanations, this stream of research suggests that psychological factors and the resulting emotional states explain entrepreneurial failure (Gelder et al., 2007; Jenkins et al. 2014). Two streams of research are at the heart of this emotive approach: discrepancy (Cooper and Artz, 1995) and threshold theory (Gimeno et al. 2007). Discrepancy theory suggests that entrepreneurs may abandon an activity if they determine that the gap between initial goal and actual performance while threshold theory argues that survival depends more on the entrepreneur’s threshold beyond which they may decide to dissolve a new venture, beyond a firm’s economic performance.

This review is by no means exhaustive. However, it points to the fact that several factors may account for entrepreneurial and business failure. Research has shown that new venture success or failure is not influenced by any one single factor, but rather many factors in a complex web, a “gestalt” of interrelationships may be responsible for success or failure (Miller and Friesen, 1984; Duchesneau and Gatner, 1990). Each of the factors reviewed may operate independently or in conjunction with other factors (Mellahi and Wilkinson, 2004). The causes of organizational failure lie neither solely in the internal organizational factors nor in the external environmental context, but rather, are rooted in the interaction of both firm level and external factors (Mellahi and Wilkinson, 2004). Khelid (2016) provides an integrative

definition of entrepreneurial failure as a “psycho-economic state of disappointment. In the absence of economic and/or psychological support, entrepreneurs are forced to exit from their entrepreneurial activities.”(p.75).

4. Methods

4.1. Research Context

The context of the research is the emerging aquaculture industry in Ghana, a country in Sub-Saharan Africa. In this research, we examine the rise and collapse of the pond-based aquaculture industry in Ghana between the periods of 1980-2009 in three administrative regions with some of the highest concentrations of pond aquaculture during this period. Modern forms of aquaculture had been introduced in the country in the early 1950s when pond construction began on an experimental scale and farmed fish were used to stock reservoirs (Balarin 1988; Prein et al., 1996). The FAO (2014) reports a substantial growth in aquaculture in Ghana. Much of the recent growth of the sector has come from the establishment and growth of a few large-scale cage farms and production. Although the numbers are clearly overestimated (Kassam, 2014), the country has witnessed increased aquaculture, mainly using *cages*. Pond aquaculture, however, still represents a very small and decreasing relative contribution to overall aquaculture production (Kassam, 2014). Ghana is suitable for tropical aquaculture. Aquaculture in particular is important because it can supplement the nutritional needs of the population. Fish is recognized as the most important source of animal protein in the country and the average per-capita fish consumption — estimated to be 21.7 kilograms — is one of the highest in sub-Saharan Africa (MOA 2011). Fish is estimated to represent approximately 60 percent of average animal protein intake in Ghana. However, persistent shortfalls between supply and demand have led to the importation of about \$200 million of fish annually (MOA, 2011). The Department of Fisheries is the lead agency vested with the administrative control of aquaculture. It is also the main institution responsible for planning and development in the aquaculture sub-sector whilst the Water Resources Institute of the Council for Scientific and Industrial Research (CSIR) is mandated to carry out aquaculture research (www.mof.gh).

We chose the period 1980-2009 because prior research has documented that the takeoff phase in the industry started around 1982, the period that Priens and Ofori (1996) call the “surge”, a period in which the industry really started to grow. Priens and Ofori (1996) note that a nationwide campaign to promote fish farming in the country was launched by the Fisheries Department in the early 1980s. This led to a number of people entering fish farming but, poor provision of technical support in all key aspects of fish farming such as site selection, pond design, and construction, pond management, availability of fingerlings, led to poor performance of many of the farms (Priens and Ofori, 1996). There is some general agreement that the pond-based experiment had failed badly by the early 2008. By 1995, there were a mere 375 ponds nationwide with only two cages and two pens (Asmah, 2008). We note that there are two main forms of aquaculture: pond and cage culture. This study focuses exclusively on the failed pond culture experiment. The decision to focus on the pond-based aquaculture is driven by our interest in understanding why a group of firms failed collectively in spite of market demand for their product.

4.2 Fieldwork and data collection

Sample

One important methodological issue in entrepreneurship research is the extreme heterogeneity of new ventures and their founders (Gartner, Wennberg et al. 2010) and the need, therefore, to control for that heterogeneity (Wennberg, 2005). Following Khelil (2016), the sample selection was guided by a number of factors to decrease unobserved heterogeneity: only small (fewer than 20 employees), new ventures (had been in business for fewer than 5 years) that were created from the scratch by independent, single founders were part of the sample (Wennberg et al. 2010). New firms generally suffer from the liability of newness and their survival is always in doubt (Stinchcombe, 1965). Repeat entrepreneurs who had experienced multiple failures were excluded because such individuals may rely on psychological compensatory mechanisms and therefore be unable to differentiate global, from firm related failure (Jenkins et al. 2016, Khelil, 2016). We relied on “privileged witnesses” or “people who, thanks to their professional activities, were in direct contact with the subjects under study” (Quivy and Van Campenhoudt, 1995, p.66) to identify this hard to reach group. Our source was a local NGO that had a database of entrepreneurs they had either helped or contacted during the formative years of their ventures. Out of an initial list of 134, we were able to locate and interview 69. We approached 12 of the individuals on the list, and nine consented to take part in the study. Those who responded initially became our link to others. In this respect, we used snowballing as a sampling technique for studying this hard to reach group. According to Pires (1997), snowball sampling is a way of building a homogenous sample, allowing one to describe the internal diversity of the sample (Khelil, 2016). We collected data from three administrative regions determined to have some of the most concentrations of aquaculture ponds in the country. Figure one shows the three contiguous administrative regions: Volta, Greater Accra, and Eastern regions.

Procedure

Our interest was in exploring how and why entrepreneurs and businesses engaged in a novel activity with market potential failed. According to Yin (2003:1), "case studies are the preferred strategy when "how" and "why" questions are being asked. We followed established case study research methods in the design and analysis of the data (Miles and Huberman, 1994). We used interviews because qualitative research is well suited to examining poorly understood phenomena. More importantly, the logistics and problems of doing quantitative studies in a developing country have been noted by other researchers (Hoskisson et al., 2000) and other researchers have successfully used detailed field-based archival. Since the data collection relied on retrospective recall, we followed existing guidelines for improving the accuracy of the data (Miller et al., 1997). We allowed respondents to answer questions freely and as honestly as possible, to skip questions if they chose, and decline to answer a question if they could not recall something. In all, we conducted interviews with 69 individuals who started an aquaculture business between the periods from late 1990 to early 2009. All the ventures were new ventures that started and operated in some shape during the period 1990-2008. Table 1 presents a descriptive information on the sample. Data were collected during in-depth, semi-structured interviews (Flick, 2006) reliant upon interview guides (Holliday, 2007; Patton, 2002). Interviewees were asked to describe and make sense of the following: motivations for starting the business, production model, relationships with other producers, nature of institutional support, knowledge about fish biology, decisions about abandoning their activities. The structure and contents of interviews built on extant literature but the empirical research was exploratory and flexible. All interviews occurred in residences of respondents and when the site of the ponds was close, the interviewers visited those sites. The average interview lasted for about an hour with some going to about 2 hours, with the shortest taking 44 minutes. We called the interviewees back for clarifications when needed. In cases of non-English speaking respondents, we transcribed responses into English using trained linguists. Each interview ended with an open invitation to respondents to share any other knowledge they had that they wished to share. We were concerned

that given the passage of time, the recall of events could be blurred but this was allayed as respondents had vivid recalls of their experiences and several noted that it was painful but therapeutic to talk about their failed ventures.

Reliability and validity issues are important but not easy to maintain when we study phenomena in new firms as one may be making “meaning on a grand scale” (Aldrich and Fiol, 1994, p.666). Despite that, we took steps to increase the validity and reliability of our data by following three protocols. First, our general research questions were based on existing theories of entrepreneurial and business failure. Second, our research focused on a small geographic area and that allowed us to trace the relationships between most of the players. Finally, we recorded and transcribed all interviews verbatim. We made field notes to verify information and we replayed tapes over when needed to get a clearer picture of what was going on. Field notes were written in the hours following the interview to keep the procedure compliant with the “24-hour rule” (Miles & Huberman, 1994). We collected data covering the start, growth, and abandoning of the economic activity. The interview collected basic demographic data and covered the following areas: production strategy, background knowledge of aquaculture including fish biology, initial motivations for starting the business formal, awareness of any government technical support for a that sort of project; length of time the project lasted; reasons why they believed they were successful or unsuccessful. (The interview guide is in Appendix A).

4.3 Data Analysis

The research followed existing guidelines for case analysis (e.g. Miles and Huberman, 1994; Strauss and Corbin, 1998). The information from these interviews was coded according to the key variables and relationships in question—specifically, formation, management and exit of businesses. The interview data were coded according to the recurrence and emphasis of certain themes as an indicator of the strength of those themes (Weston et al., 2001). A theme is defined as a recurring topic of discussion that captured an interviewer’s central ideas (Dutton and Dukeric, 1991). After consolidating the main themes from all interviews, we collapsed some dimensions. Each of the individual sentences was reviewed to extract key sentences that related to the theme. These are reported in Appendix A.

5. Findings

We present a model of business and entrepreneurial failure and show how a gestalt of events led to the failure.

5.1 Early Years and Missed Opportunities

Our initial focus understood the precipitating circumstances and key events surrounding the founding of these businesses. We sought to understand what that led entrepreneurs to set up shop around a novel activity. The data shows that the idea for aquaculture came from the government. Early adopters (defined as those who started around 1982) mentioned that they first heard of the idea of tilapia aquaculture from government officials (Agricultural Extension Officers). Tilapia is native to Ghana so all farmers were familiar with tilapia in the wild. What was new was the idea that this species of fish could be cultivated in ponds under controlled conditions. The popularity of the fish and a ready market seemed to be added attractions for rushing into this activity. There were high expectations as people saw the opportunity to grow fish for both consumptions and for sale. None of our respondents had any prior experience with pond fish farming, meaning that actors were all novices although 12 respondents had some experience with fish holes, the practice of using nets in the lagoon to trap young fish that matured and then harvested. In this case, the fish still lived in natural, not an artificial ecosystem and issues of health and feeding were not the responsibility of the farmer. Beyond seeing opportunity, there was little understanding of the complexities involved in aquaculture, including an even rudimentary understanding of fish biology and

the science behind the construction and siting of ponds, feed composition and fish nutrition, including Feed Conversion Ratio (FCR). The FCR is the amount of feed required to produce 1 kg of fish; the lower the FCR, the better and the FCR of tilapia is about 1.5 (De Long, 2009). The FCR for tilapia aquaculture systems in Africa is typically between 1.4 and 2.5 (Ofori et al. 2009). An FCR higher than normal can be the result of a high percentage of dust in the feed, variability in the reported nutrient content of the feed and/or a miscalculating the number of fish remaining in the cage because of unrecorded mortality (Ofori et al. 2009). Although the FCR was not calculated for the sample, indications are they were on the very low side considering that farmers were using sinking, not floating feed because the latter promotes greater consumption. In addition, most of the farmers reported feeding household waste, not formulated feed to the fish. None of the farmers used aerators to increase oxygen supply in the ponds resulting in high mortality rates. Most respondents had no understanding of why it was important for the ponds to be drained periodically or the role of oxygen in the ponds. A lack of adequate oxygen meant that fish development and growth was low and the mortality rate of fish high. A minimum oxygen requirement was necessary for fish health because oxygen is required for growth, tissue repair, and reproduction. Oxygen depletion or hypoxia is detrimental to fish growth as it causes asphyxiation and fish death (Svobodova, 1993). Respondents admitted they observed the high mortality but believed it was just a normal part of the process and that as long as the majority of the fish survived, they believed they would be successful. Fish also needed to be fed adequately with fish feed that contained a mix of particular nutrients. The lack of commercially available feed meant the farmers were generally improvising with feed. In effect, the technology was not only ill understood; there was no effective supply chain to support the industry. The problem in this particular case was that even minimal success in this activity required a clear understanding of both the technical and scientific dimensions of fish farming and the mechanics of pond construction and management and these key drivers were missing. The industry generally lacked key resources and worse yet, the actors made very little effort to try to seek assistance from the government that had introduced them to the idea. Instead, respondents indicated that right from the start, they started asking other people who started fish farms before them for answers to their problems. Thus, may have sown the early seeds for future problems for the businesses and entrepreneurs. Prior research has shown that the lack of industry-specific knowledge often has a negative effect on early firm survival (Presendorfer and Voss, 1990).

5.2 Production Strategy

There were some initial successes recorded by the early adopters. Respondents indicated that they harvested some fish in the beginning. This, they indicated, gave them hope for a better future. While they were unable to know what the size of the fishes harvested should be, most respondents indicated that the fishes were of the sizes of wild tilapia in local the rivers and lakes. These early successes were what encouraged later adopters to enter the industry. Pressed on how many harvests they saw before venturing into the industry, later adopters indicated an average of two or three harvests. When asked from whom they specifically copied ideas and what they copied, respondents indicated they sought out the farms in their area and shared ideas with those farmers. The later entrants replicated existing pond construction, feeding method, and harvesting techniques from the early adopters. Respondents noted that they improvised with feed, including agricultural waste, and used animal manure to fertilize the ponds. It was clear that the second wave of entrants into the industry began copying the early adopters. Within the whole industry, there quickly emerged a high degree of copying and learning from each other, thereby confirming some earlier observations that imitation of successful models is higher under adverse environmental conditions because success is often uncommon (Lant and Mezas, 1990). The catch here seems to be how both the early and late adopters defined success. In both cases, the representative sample on which they based the definition of success was questionable, if not inadequate. By using

knowledge from small, non-random samples as a shortcut for decision-making, these late adopters may have underestimated the errors inherent in these unrepresentative samples (Kahneman et al., 1982).

A far more important phenomenon also emerged out of these initial conditions. This was the emergence of a specific way of thinking about the management of the businesses. This sort of mental model is akin to what Spender (1989) calls an “industry recipe.” The industry recipe is a taken-for-granted mental model and knowledge that is shared by a community of actors; it functions as a collective mechanism for reducing uncertainty. Although industry recipes can be useful, they can also become detrimental if based on erroneous elements as seems to be the case in our study. In this particular case, the excessive imitation seemed to have brought premature closure to the active search for alternative production models that could have been more productive. Prior research has shown that owners who are improvising under resource and time constraints hardly have the luxury for exploring alternatives (Aldrich and Ruef, 2006). Miner et al., (1999) found three distinct types of imitation. Frequency imitation when the most common practices in a population are copied; trait imitation when the practices of the high-profile status organizations are copied and outcome imitation when practices that are perceived to be successful are copied. In the case of outcome imitation, success biases may play a large role (Denrell, 2003) and we observed all these types of imitation in our sample.

Imperatives and Perils of Imitation

The data pointed to a tendency of the entrepreneurs to copy each other. Imitation can spur productive innovation, or amplify the errors of early movers. Thus, imitation can lead to large positive or negative outcomes for individual firms and society as a whole. It is hardly surprising that startups associated with a novel activity would seek out other actors to imitate. Start-ups seeking to manage the uncertainty and complexity associated with new market entry are likely to seek examples from other firms (Haveman 1993). Under such conditions, the entrepreneurs were clearly unsure of the likelihood of possible outcomes, and had difficulties recognizing cause-effect relationships and the full range of potential consequences of the business decisions they were making with respect to their farms. There was certainly high uncertainty and ambiguity about what was required to build successful aquaculture operations. Under such conditions, it was easy to see why respondents were particularly receptive to information implicit in the actions of others. Such information, while imperfect, can have a strong influence on managerial perceptions and beliefs (Welch, 1998). Respondents indicated that because the only models they had was people who had started fish farming earlier, what started happening was they started using information that was filtering in from what was fast becoming a network of entrepreneurs engaged in the same activity. What was emerging here was an example of herding behavior. Herding behavior is based on the theory of information cascades or “social learning” (Banerjee, 1992; Bikhchandani, Hirshleifer, & Welch, 1992, 1998). Herding behavior explains fad-like behavior in the adoption of new technology. An information cascade occurs when an individual ignores his or her own private signal about the value of a technology and relies, instead, upon the observed actions of others. This can lead to serious problems if the observed actions in question are based on still other observed actions rather than private signals. As Bikhchandani et al., (1992) put it, information cascades occur “when it is optimal for an individual, having observed the actions of those ahead of him, to follow the behavior of the preceding individual without regard to his own information”. An early preponderance towards adoption or rejection causes subsequent individuals to ignore their private signals, which thus never join the public pool of knowledge. In fact, the public pool of knowledge need not be very informative to cause individuals to disregard their private signals. As soon as the public pool becomes even modestly more informative than the signal of a single individual, the next individual defers to the actions of predecessors and a cascade. Identification with others can actually be sustained in the absence of social interaction (Staber, 2010). Herding behavior may have promoted single-loop, rather than double loop learning (Morgan, 1986). Single loop learning keeps organizations on the wrong course, as people are not prepared to question fundamental assumptions.

The capacity to question appropriate behavior is the distinguishing characteristic of double-loop learning (Morgan, 1986).

Over time, what began to emerge was a high level of isomorphism. Mimetic isomorphism can be viewed as a rational imitation of a superior organization, although sociologists often emphasize ritualistic rather than rational motivations. Isomorphism is a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions (Hawley, 1986). Among several kinds of institutional isomorphism, mimetic isomorphism is the process whereby organizations model themselves on other organizations when the environment is uncertain. The modeled organization is perceived as more legitimate or successful. Such mimetic behavior is rational because it economizes on search costs to reduce the uncertainty that organizations are facing (Cyert & March, 1963).

The excessive copying might have helped the industry if what everyone was copying was indeed a sustainable model. However, it was clear the “dominant” model was flawed. Some respondents noted that their second harvest was actually less than the initial one. Subsequent harvests were progressively worse than the preceding one. A fish biologist explained this anomaly to the author in a personal interview. As fish droppings and detritus increased in the ponds, the oxygen levels are progressively reduced, leading to greater fish die off and stunted growth of surviving fish. The antidote to fish die-offs was either to drain the ponds periodically or introduce mechanical aerators to increase oxygen levels in the pond. None of the respondents had knowledge of the need for mechanical aerators. We probed to understand why respondents did not realize after two cycles that they had a major problem on their hands especially as the other farmers they spoke to seemed to be having the same problems. What respondents did, instead, may have amplified rather than dampened the initial deviations. First, they increased the stocking rates of their ponds by increasing the number of juvenile fish or fingerlings they placed in each pond with the hope of increasing yield. This, of course, meant higher competition for feed and even lower oxygen levels and survival rates. Second, when pressed if there was a search for reasons why the farms were underperforming, respondents indicated that some farmers suggested that inadequate feeding was to blame for the low yields. While that could have been a possibility, it may have been quality or nutritional value of the feed, rather than its quantity that was to be blamed. Therefore, in explaining the deviation, respondents started ascribing failure to what they “knew”, rather than seek alternate explanations. Finally, there was a lack of effort to seek professional help from the government extension officers, and instead, the actors reverted to more self-help and self-reliance. Seeking alternative explanations and help could have served as a dampening effect that could have helped push the industry towards some stability (Maruyama, 1963). Instead, we see cases of initial positive feedback amplifying into deviations. Actions have amplifying effects on a situation if they make the small change stronger or if they intensify the change or escalate the consequences (Maruyama, 1963; Weick, 1979). Theory suggests that as social systems experience stress, groups or people become interdependent and positive feedback reinforces or amplifies small changes. Increasing stocking and feeding rates was a form of positive feedback. Rather than dampen the deviation, these actions increased and amplified the effects of the deviations. The convergence of imitation and improvisation under conditions of uncertainty became a lethal brew that only served to amplify deviations.

5.3 Social Ties and Outcomes

We began to notice from the data that the actors, even at this early stage, were building relationships and building social ties to each other. The emergence of ties would later become a liability as interconnectedness and imitation would amplify even small changes (Wheatley, 1999). Embeddedness has its strengths and weaknesses (Uzzi, 1997). While not engaged in exchange transactions, the entrepreneurs, in this case, had clearly developed strong social bonds with each other. One direct result of these strong ties was the willingness to share knowledge and information. Respondents indicated that

they felt a sense of obligation to tell others about what they were doing if they asked and we know that ties within networks can facilitate knowledge transfer (Wasko and Faraj, 2005). One suspects that individual expectations of maintaining social ties encouraged the willingness to share information. The existence of social capital can facilitate knowledge sharing (Nahapiet and Ghosal, 1998; Chen, 2007). There may also be a cultural dimension to the willingness to share information readily. Ghana is a collectivist culture (Hofstede, 1989) and research has shown that people in such cultures are more open to sharing information they believe is for the good of their organizations (Hwang and Kim, 2007). One result here was that over embeddedness may have hampered adaptation and the search for new opportunity and information as non-redundant information becomes difficult to get from the network (Burt, 1992; Uzzi, 1997).

5.4 Failure to Comprehend Nature of Threats

An important question we asked ourselves was why firms failed to learn from the failure of earlier firms. We saw from the data that there was largely a failure to learn from the failure of other businesses. This may have been so because learning from other firm's failure is difficult. Organizations may have masked failure to save face or hide failure to be seen as relevant (Pfeffer, 1981) and it is not easy to link actions and organizational outcomes because of the ambiguity of organizational systems (March and Olsen, 1972).

We explored why respondents were unable to see the dangers that were looming and the dysfunctional traps they had fallen in. The data shows that several cognitive biases may have prevented them from seeing the seriousness of the situation. Respondents seemed to have adjusted their aspirational levels to the facts as they saw them. Several respondents indicated that considering all the problems they were having, "any harvest was better than none." Thus, while they should have seen repeated dwindling harvest as a serious dysfunction, all they did was adjust their expectations to match the realities they confronted. In addition, instead of seeing low yields and high mortality because of the things they were doing wrong, most respondents indicated that they thought the low yields and high mortality were results of bad advice they got on what to feed the fishes from other people. Respondents repeatedly used the word "hope" as an indicator of their optimism that things would turn around in the face of what would appear to any critical observer that the industry was having serious problems. This unrequited optimism may have prevented the actors from realizing that they were in a crisis. It seemed impossible for the actors to learn any lessons because they were still not seeing what was happening as failure, yet people are only able to learn when they "recognize errors, understand why errors are errors, compare errors to correct actions, and update knowledge structures accordingly" (Stiso and Payne 2004: 3). The cycle of imitation, negative outcomes followed by repetition and intensification of unrequited optimism meant that deviations were being constantly amplified and the conditions of failure magnified.

Institutional Support

The lack of institutional support seemed to have played a large role in the failure of these businesses and entrepreneurs. The irony was that although the government did not directly provide adequate follow-up guidance, there was personnel in the Ministry that could have been of assistance. Clearly, this was a low munificent environment to start with. What amplified this was the failure to access the little assistance that was available, thereby aggravating the impact of low munificence. Environmental munificence, the extent to which critical resources exist in the environment, is a critical factor for new industries (Castrogiovanni, 1991). The more munificent the environment, the greater the firm's opportunity to acquire necessary resources (Bruno and Tyebjee, 1982). What is more important may be how the industry actors themselves perceived resource availability. Wieck's (1969) points out that it is how actors perceive munificence, more than the availability or otherwise of resources themselves, that is important to entrepreneurial behavior. We found that majority of the entrepreneurs were simply not aware of the

availability of even the limited resources that they could have accessed. The same ministry that introduced the idea surely had some resources. The failure to seek help from the very source from which they heard of the opportunity may be an indication of entrepreneurial failure) on the part of the farmers. (Minniti and Bygrave, 2001). It is also clear that the government for its part failed these entrepreneurs. Merely introducing a business idea is not enough and the extension of support services was key to ensuring that ideas translated to sustainable businesses. That was clearly not the case here.

5.5. Decline and Failure

The businesses we studied failed because of multiple factors. First, the farmers did not have a clear understanding of the production system. The siting of the ponds, drainage, and fish seed quality, the role of oxygen and proper fish nutrition the biological aspects of the production model was ill understood and there was a lack of appreciation of the value chain. Our findings on activity seems to mirror the stages of organizational collapse. Weitzel and Jonsson, (1989, p. 94) observed that organizations enter a state of decline when they fail to "anticipate, recognize, avoid, neutralize, or adapt to external or internal pressures that threaten their long-term survival." Masuch (1989) notes that all declining organizations must pass through a threshold, a point of no return before they collapse. According to the authors, organizations must perform three tasks to avoid collapse and these can be extended to the industry: (1) identify the threshold condition, (2) identify possible dangers in the environment and (3) muster sufficient reserves to buffer the adverse effects. Our analysis of the data shows that actors failed on all three conditions: they failed to anticipate, recognize, and certainly did little to neutralize the threats that were buffeting them and in the process failed to see what a tightrope they were walking.

Second, industry players were clearly neither able to identify the hazards they faced nor calculate the risks (i.e., the threshold condition) of their individual and by extension, now collective behavior. Repeated low yields of fish harvest and high mortality of younger fish were symptoms of failure and impending failure. Rather, they assumed that such mortality rates and low yield were an acceptable risk of the business. One respondent noted, "Everyone I asked told me the same thing. Their small fishes were dying. We just thought that those fish that were strong enough would survive. We were just happy that some survived, even if it was a small number." What they failed to realize was that low harvests meant that the farms were no longer economically viable as their expenses eventually outstripped their revenue. Clearly, no business can survive for long without a positive return to capital. Respondents used phrases like "we knew our days were numbered" once those they started farming with started abandoning their projects. Finally, any signals that emerged seemed to have persisted because actors lacked an adequate understanding of the situation; they seemed to have been affected by success biases and attribution errors as well as the complexity of the situation.

6. Discussion

This research focused on explaining entrepreneurial and business failure in agribusiness in a developing country. Developing economies are characterized by institutional voids, market imperfections, unreliable information flows (Acemoglu, Johnson, & Robinson, 2001, Cruz, Howorth & Hamilton, 2012) and these, in part may have accounted for some of the problems these businesses and entrepreneurs faced. At the same time, personal choices of the entrepreneurs was a factor in their failure. We uncovered some possible explanations for entrepreneurial and business failure associated with a novel activity. Our findings demonstrate that there were deterministic, strategic choice and some institutional explanations for the failure of businesses associated with what was a novel activity. Our conclusions mirror Gillespie and Dietz's (2009) definition of entrepreneurial failure, "the locus of control for the failure was internal to

the businesses, and the context for the failure involved external influences.” Tisdell (2001) suggests that the economic failure of an aquaculture project may stem from production, technical, cost or marketing problems. This study similarly found that production and technical problems were causes of failure. Our findings are generally consistent with those from both institutional and deterministic perspectives. Theories on isomorphism (Haveman, 1993), emphasize that firms enact behaviors of by firms with ideal traits (e.g., large, prestigious firms) whereas the strategic groups literature reasons that firms model themselves after similar firms (e.g., those they resemble) when considering their competitive strategies (Porac, Thomas, Wilson, Paton, and Kanfer 1995; Yang and Hyland 2006). The findings in this study are more consistent with strategic group literature. Contrary to scholars who suggest that it is less likely for firms to imitate the actions of small firms (Terlaak and King 2007), our research shows that in the absence of other options, firms may imitate similar others who may be small. Start-up firms within the same industry often have similar strategic profiles. They tend to have few assets and human resources (e.g., small numbers of employees), have limited resources (Bradley, Wiklund, and Shepherd 2011), and are run by individuals whose work in the start-up goes beyond merely earning a living. What they do shapes their personal identity as “entrepreneurs” (Farmer, Yao, and Kung-Mcintyre 2009). In their struggle to survive, they commonly employ similar strategic tactics (Winborg and Landstrom 2001). These and other similarities among start-ups make them likely peers. Our findings show that when firms are similar in attributes and context, they rely upon each other as a reference group in navigating complex and uncertain decisions (Peng, Tan, and Tong 2004). Firms in the same group tend to pattern their actions after one another, even when faced with the prospect of competing (Porac, Thomas, Wilson, Paton, and Kanfer 1995). In this case, questions of competition did not arise, as there existed a largely untapped market. However, the evidence confirms that the entrepreneurs we studied used each other as a reference group and copied each other extensively. Existing research shows that most theories of organizational imitation tend to focus on the replication of routines and models of apparently successful organizations (Burns and Wholey, 1993). The critical issue here seems to be how imitators define what success is. It seems that in some cases, the definition of success is subjective and the existence of success biases may have led to the use of a low success threshold in determining who to imitate.

This research makes some important contributions to the entrepreneurship failure literature. First, it explains entrepreneurship and business failure in a developing country context, a geographic area with little research; and more specifically research on industry founding and disbanding. Hoskisson et al., (2000) note the paucity of research on the emerging economies of Africa and the Middle East. The authors call for research attention on the factors that promote and restrict the emergence of new market economies especially in Africa and the Middle East. This research responds to that call by focusing on business and entrepreneurial failure in an emerging economy in Sub-Saharan Africa. Second, the research focused on businesses with a truncated history. The firms that struggled and failed early. In this respect, the study responds to Aldrich and Ruef (1994) call for testing our theories of failure in industries with truncated histories because they may provide the best opportunities for understanding founding and disbanding of business. Third, the study provides additional evidence on one population-level consequence of individual-level copying practices. Specifically, it shows that the convergence of uniform practices (Abrahamson and Rosenkopf, 1993) can lead to failure thereby demonstrating one population-level consequence of inter-organizational imitation (Haunschild and Miner, 1997). The findings show that developing collective agency early in the life of a group of businesses may have collective consequences for that group. Co-creating and developing a production model that was widely shared assured that industry participants sealed their collective fates, so to say. Finally, the policy implications of this research are timely and important. Governments in developing countries continue to hold up entrepreneurship as a major tool for economic development. Considering the large role governments play in these countries, it is important that they understand how innovation, especially in agriculture, plays out. This research

shows that governments must do more than just introduce an idea, especially those that involve novel activity, and that continued institutional support might be a *sine qua non* for success with novel ideas.

Practical Implications

There are some important lessons from this research for entrepreneurs and policy analysts. First, the prospect of entrepreneurship and economic development, long held as a solution for moving developing countries out of poverty, may require consistent government support. Governments have a big role to play in developing and emerging economies as institutional conditions are the dominant factor influencing the nature and pace of entrepreneurship in these areas (Peng and Heath, 1996; Smallbone and Welter, 2001; Williams et al. 2016). In addition, multilateral organizations such as the World Bank and IMF continue to urge governments in developing countries to promote agriculture and entrepreneurship. The lesson here is simply introducing a novel agricultural idea may not be enough. Governments and policymakers must provide the necessary institutional support to help entrepreneurs succeed. Policymakers need to build a complete business case and provide the scaffolding, including a better understanding of the entire supply and value chain associated with the activity. A carefully thought out plan would have included training and skill transfer to interested farmers prior to the start of their businesses, and continuing support as the industry developed. Relative resource availability would have allowed for building some dampening effect when faulty actions started creating the conditions for failure. The need for extension services in the form of technical support on pond construction, feeding, fingerling availability and the availability of proper fish feed was important. Governments themselves need not be active investors. However, it is important for them to encourage simultaneous investment in supporting industries such as feed as was the case in the salmon aquaculture industry in Chile (Perlman and Juarez-Rubio, 2010). Providing a portfolio of support policies on early stage support including training services for prospective entrepreneurs, a whole entrepreneurship ecosystem so to say is important (Spigel, 2015).

Second, entrepreneurs venturing into business need to understand the peculiar problems associated with agri-business, particularly if it involves a novel activity. Early adopters must build legitimacy for their actions to open up access to needed resources, including investment capital and social support, which are all vital to new industry creation. The use of collective action may be one way of building legitimacy in a new industry with very small players. For example, forming an industry association early would have made it easier for the industry to get access to needed government support. Industry players must learn to recognize problems in their environment as well as pay attention to their own implicit assumptions about what they do; tampering their enthusiasm and hopes as circumstances evolve. Both weak and strong ties can have positive results under the right circumstances. However, industry actors need to realize that interconnectedness should not necessarily lead to convergence of ideas and behavior. Instead, active search for diverse knowledge in the early years of an industry may prove beneficial in the end.

6.2 Implications for Theory

It is often difficult to predict the consequences of imitation for a collective of firms (Miner, 1999). This research may provide some preliminary answers. Where copying is process, and outcome based and imitation leads to the emergence of an “industry recipe,” that opens up the possibility for failure in this case, or success if the dominant model that emerges work. The finding that firms copied from early adopters they believed had legitimacy in their eyes is consistent with earlier research that demonstrated that the characteristics of earlier adopters generate a certain level of vicarious learning in follow-up adopter groups (Burns and Wholey, 1993). Second, while mutual learning may mitigate the impact of adverse conditions at founding (Miner and Hauschild, 1985), this research shows that it may be what is learned, rather than learning per se, that counts. Finally, we define success in new ventures may need further exploration. In this study, it was clear that a longer time horizon was necessary to determine

whether the production model was successful or not. Entrepreneurs may need to temper their enthusiasm and tendency to exaggerate success and additional studies on how success is defined in startups and the early years of a business would be helpful to our understanding of business founding and failure.

6.3 Conclusions

Our understanding of business and entrepreneurial failure in emerging economies remains rudimentary and this study adds some richness and depth to the entrepreneurship failure literature. Primarily, it shows that linear explanations of failure may offer an incomplete understanding of what may clearly be a dynamic interplay between context, strategic choice, and process. Further refinement of the emerging model may substantially enhance our understanding of business failure and enrich existing theories of business and entrepreneurial failure.

Like all studies relying on retrospective recall of data, this research has some weaknesses. First, the recollection of events may fade with the passage of time especially since most of the farmers did not keep written records. However, we know that recall of salient events is often reflective of the facts (Nisbett and Wilson, 1977). Second, to minimize social desirability from biasing the data as much as possible, we assured respondents that we would not share their personal data with anyone. In the last five to six years (2010-2016), the dominant culture system for tilapia production has changed, and the vast majority of cultured tilapia is now grown intensively in cages, not ponds (Ayisi et al., 2016). While we must await the fullness of time to know whether any lessons were learned from the business failures we studied, initial reports show the same lack of government support for current aquaculture development (Ayisi et al., 2016) and history, may, in fact, be repeating itself.

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Appendix A

Interview Guide for Aquaculture Entrepreneurs

1. Demographic information. Please tell us about your education, work experience including any experience with fish farming. What is/was the location of your farm? Who owns the farm?
2. When did you get into fish farming? What was your motivation to start a farm?
3. What opportunities did you see in tilapia farming?
4. Before starting your business, did you get any formal training in the following: pond construction, feed, and feeding of fish, harvesting, fingerling stocking density, disease control?
5. Please describe in details what your production system was. Did you think it allowed you to grow the size of fish you wanted?
6. How many other farmers did you know who were also engaged in fish farming? Did you attempt to contact them? Did you exchange ideas with them?
7. What kind of lessons did you learn from other fish farmers? Where they helpful? Did you also teach other farmers somethings?
8. From whom did you get most of your ideas about managing your operation?
9. What challenges did you face in this business? When you had problems, whom did you talk to? How often did you talk to this person or persons?
10. Where you aware of Government extinction services in aquaculture? Did any extension officers visit your farm? How often? If they visited you, what did you learn from them?
11. Were you satisfied with the output (harvests) you made? Where the fish sizes what you expected them to be?
12. Did you think you were doing well as a business? How much income were you making? When did you know that your operation was not performing well?
13. What were the main challenges of your business? What effort did you make to solve them?
14. What do you think were your strengths as a businessperson? Your main weaknesses?
15. When did you become aware that the business was not doing well? Did you share this with other farmers?
16. Would you say most of the fish farmers you knew were a close group? Where you friends with some?
17. Can you describe the factors that led you to abandon your farm and quit fish farming?
18. Would you start a fish farm again if you get the opportunity?
19. What else can you tell us about your experience? Any advice for others who wish to start fish farming?

Table 1: Descriptive Data

% of owners with high school education and below	59.4
% of owners with tertiary education	40.6
% of owners experienced in this line of business	1.3
% Male owners	85
% with prior aquaculture experience	0
Average age of respondents	36.5
Average life farms (in years)	4.5
Number of respondents that started farming between 1980-1985 (approximate dates)	35
Number of respondents that started farming between 1985-1990	15
Number of respondents that started farming between 1990-1995	17
Number of respondents that started farming between 1995-2000	6
Number of respondents that started farming between 2000-2005	6
% Part-time farmers	65.3
% Full-time farmers	34.7
% Used training and extension services	35
% Feed household waste	70%