

Review: Iloilo's Balut Industry (Philippines)-An exploration of the environment, social organizations, and consumer demands

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Abstract. Vergara TID, Alejandria MC, Lustanas B. 2020. Review: Iloilo's Balut Industry (Philippines)-An exploration of the environment, social organizations, and consumer demands. *Asian J Agric* 4: 41-51. The province of Iloilo has one of the highest numbers of small-scale duck farms in the country. Its agricultural landscape has allowed the rise of farmers entering duck raising practices, mainly along with rice fields throughout the province. However, continuous interventions in the agricultural sector of Iloilo are directed at boosting economic growth. This paper provides a qualitative evaluation of the efficiency of current policies and implementation of rules and regulations on both the duck and duck egg industry of the Province of Iloilo. Findings revealed the need to address issues on the production, distribution, and marketing of the duck and duck egg products of the province. Environmental conditions such as climate and water access, along with the role of social organizations, and impact of existing policies play a key role in the current trajectory of the Iloilo duck industry.

Keywords: Iloilo, balut industry, consumer demands, duck, social organizations

INTRODUCTION

Iloilo's geography (region, topography, landmarks, and geography)

The province of Iloilo is in the Western Visayas Region, also known as Region 6 of the Philippines. Western Visayas is composed of five other provinces namely: Aklan, Antique, Capiz, Guimaras, and Negros Occidental. Iloilo province is located in the southern portion of Panay island, wherein it is bounded by Capiz and Jintotolo Channel in the north; Panay Gulf and Iloilo Strait in the east; Guimaras Strait in the south; and Antique in the west.

The province has the second largest total land area of 471, 940 hectares-comprising 23% of the total land area of the Western Visayas (Department of Environment and Natural Resources 2019). An estimate of 357,857 hectares is characterized as alienable and disposable land. At present, it is composed of two cities: Iloilo city (independent) and Passi City (component), and 42 municipalities. Iloilo City, which is the capital of the province, is commonly known as the 'Heart of the Philippines,' as it lies at the central portion of the country.

A province is a place of many historical and cultural landmarks, which include the Arevalo Plaza known as the first Spanish settlement in Panay to be attacked by English privateer Sir Thomas Cavendish in 1588 (Iloilo City Government 2019). The province is also known for many natural attractions, such as the Gigantes Island or 'Isla de Gigantes,' which is located on the northern coast of Iloilo where 15th-century burial caves can also be found. Sicogon Island is a 1,104-hectare white sand island near Gigantes

Island. The tallest peak in the province is Mt. Manaphag which is located on the island of Pan de Azucar. It has a height of 573 feet above sea level and is considered one of the steepest mountains in the country.

Types of agricultural activities in Iloilo

Agriculture is recognized as the principal industry in the province of Iloilo (Philippine Information Agency 2019). In 2002, it was recognized that Iloilo had the largest number of farms in the region, with 133.5 thousand farms. This is equivalent to 31.1% of the total number of farms in the Philippines (Philippine Statistics Authority 2004). Sugar farming was known to be the 'backbone of its economy' (Iloilo Metropolitan Times 2016) and was considered to be most profitable in the province, particularly in Passi City. This local industry likely started in the 19th century as it became high in demand in the market, contributing to the economic boom of the province (Philippine Star Global 2011). In 2016, Western Visayas was the top producer of sugarcane in the country, with a 15.65% contribution to the total agricultural output of the region (Philippine Statistics Authority 2019).

At present, the primary agricultural output of the region is palay, which contributes about 23.85% of the total output of the region (Philippine Statistics Authority 2019). It is ranked as the third-highest rice-producing region in the country. An estimate of 1.05 million hectares is agricultural where 35.4% is composed of rice land (National Nutritional Council 2019). The province of Iloilo is dubbed as the 'Food Basket and Rice Granary of Western Visayas' (Philippine Star Global 2011), as it is the top rice-producing province in the region. Meanwhile, Iloilo ranks

as the fifth-highest rice-producing province (Iloilo Economic Development Foundation Inc 2018).

Western Visayas attained an 8.4% economic growth rate in 2017, which is higher in comparison to the 6.7% rate of the country in the same year (The Philippine Star 2018). This significant growth is primarily attributed to the recovery of the agriculture, hunting, forestry, and fishing (AHFF) sector (Iloilo Metropolitan Times 2018). The region is also recognized as the fourth fastest-growing regional economy in the Philippines (SunStar Bacolod 2018).

Types of livelihood activities in Iloilo

Around the late 18th century, the province of Iloilo was known as the 'textile capital of the Philippines,' as it established a large-scale commercial weaving industry (Funtecha 1981). At present, it is still known for many cottage industries including pottery, ceramics, and woodcraft. In 1855, the province opened its own international port, 'El Puerto de MuelleLoney,' also known as 'Iloilo's River Wharf,' which encouraged trading globally; it was known as the biggest port in the Philippines (Province of Iloilo 2018). It also became a premier province of the country mainly due to its numerous economic activities. Iloilo is considered the primary commercial and trade center of Western Visayas. It is also where infrastructure, telecommunication systems, ports, and other utilities are available (Mangahas 2006). Recent increase in growth rate has been attributed to the industry and services sectors (National Economic and Development Authority 2017).

Iloilo belonged to the top ten highest fisheries producing regions in 2015-2017, garnering a 2.86% share in the total output of the country (Philippine Statistics Authority 2018b). The region has also been ranked as the second-highest producer of milkfish (Philippine Statistics Authority 2019). The province ranks 5th in poultry and livestock (Iloilo Economic Development Foundation Inc.

2018). In 2016, the Western Visayas region had the second-highest inventory of native chicken with a 9.52% contribution in the total Philippine inventory (Philippine Statistics Authority 2016a). In the same year, the region placed first in carabao production with a 15.10% contribution.

The rise of duck farming industry in Iloilo

Duck raising is being promoted for the improvement of the agricultural sector through the Integrated Rice-Duck Farming System (Pacamalan 2001). The use of ducks has been considered as a good alternative for chemical pesticides utilized in growing rice (Escobin et al. 2009). It is being implemented, as it has the potential to increase rice productivity while reducing the cost of production. One of the informants, Mary is a farmer and duck raiser located in the municipality of Barotac Viejo. She started raising ducks in 1983 since their income from rice farming was not sufficient. She explained, "*Pero saamon, iyanangnakapatapossamgaanakko*" (For us, [duck farming] helped my children to finish their education). Integrating duck farming into her livelihood has allowed her children to finish formal education. It has been recognized as a significant source of livelihood particularly in rural and low-income communities (Jha and Chakrabart 2017).

In 2001, Iloilo became the third-largest duck producing province in the Philippines; Nueva Ecija and Pampanga ranked first and second, respectively (Hui-Shung and Dagaas 2004). It has also been identified that duck farms in the provinces of Iloilo and Quezon are relatively small (Chang and Villano 2008) in comparison to farms in Nueva Ecija and Pampanga. Western Visayas has an estimate of 1.36 million backyard duck farms, the largest number of small-scale farms in the country (Philippine Statistics Authority 2016b). The top three duck producing region in 2018 were Central Luzon, SOCCSKSARGEN, and Western Visayas respectively (Philippine Statistics Authority 2018a).



Figure 1. Geographical map of Iloilo province, Philippines

RESEARCH OBJECTIVE, SIGNIFICANCE, AND METHODOLOGY

This paper explores the intersections of contexts such as the environment, social organizations, and consumer demands in situating the status and the trajectory of the duck and duck egg industry in the province of Iloilo. Through interviews and participant observations among producers, retailers, vendors, and consumers; this paper identified the key issues and adaptations that local stakeholders are participating into access and promote their interests in the industry. This paper also provides a qualitative evaluation of the efficiency of existing policies on duck and duck egg industry that are affecting the stakeholders in the province of Iloilo.

CONSUMER DEMANDS

Locations and types of production

Duck raising has been highly associated with the rice farming system. In Iloilo, the main source of income for locals is primarily rice farming complemented by raising animals such as ducks (Lavega 2007). In the province of Iloilo, the selected informants are in the municipalities of Ajuy, Barotac Viejo, and Iloilo City. The municipalities were selected to provide a narrative on the rice-duck farming system being practiced by local farmers. Meanwhile, the balut dealers identified were mainly located within the city proper where balut eggs are usually sold along the streets. Balut is a fertilized duck egg that has

been part of Filipino socio-cultural history (Magat 2002). While it is also a traditional Filipino delicacy, boiled, and incubated to perfection, balut plays a major role in the duck industry in the Philippines (Escobin et al. 2009).

The identified informants included: 4 duck farmers, 1 duck farmer and balut maker, 1 balut maker, and 3 balut dealers. These key informants were selected primarily because of their geographical location. Duck farms are categorized into two types: commercial and backyard. The difference between the two lies in the number of ducks where the former requires more than 100, regardless of their sex and age (Chang and Villano 2008). The selected duck farms in the province of Iloilo are placed near rice fields with a population of 200 to 400 individuals.

Producers, distributors, and industry dynamics

The local duck industry is primarily composed of small-scale producers and traders; it was considered fragmented in comparison to commercial chicken (Hui-Shung and Dagaas 2004). Iloilo is dominated by small-scale duck farms that are unable to supply the local demand for duck eggs. As a result, local businesses rely on supplies coming from other provinces. One of the informants, Roselyn, explained her experience as a balut dealer for 7 years:

"R: Sa Bulacannga--sa Pampanga meron pero datisa Iloilo lang. (In Bulacan—also Pampanga but before we only get supply within Iloilo)

T: Iloilo po. Bakit po huminto sa Iloilo? (Iloilo. Why did you stop buying in Iloilo?)

R: Kasi natuklasan namin doon sa Pampanga na mas mura siya (We discovered that the eggs are cheaper in Iloilo)."

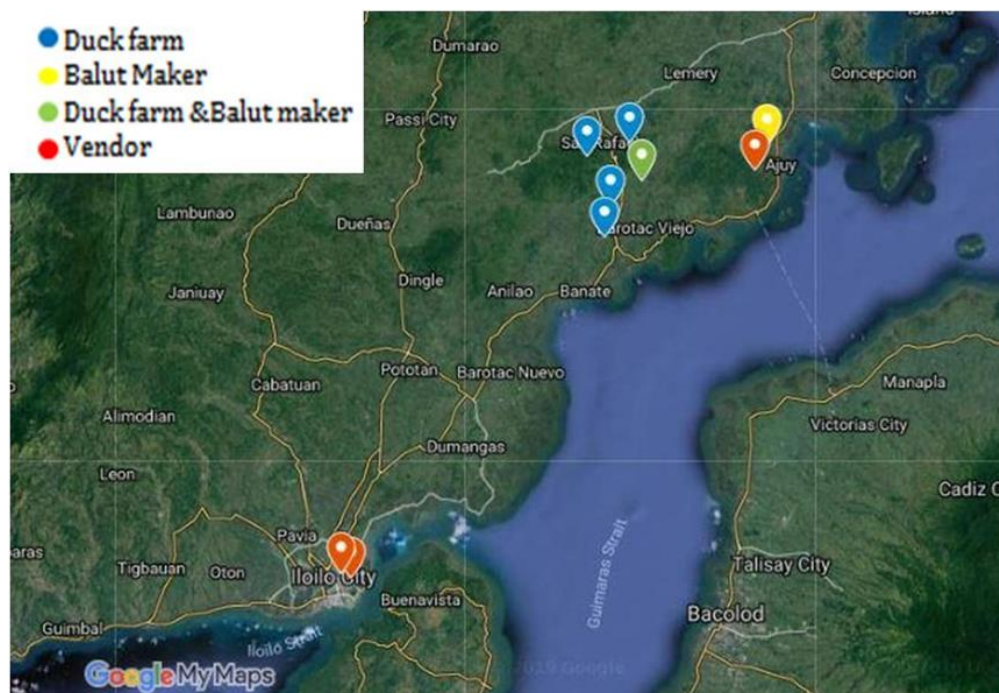


Figure 2. Location of selected informants in Iloilo, Philippines.



Figure 3. Processing of eggs in Iloilo, Philippines

Due to balut's high demand among Iloilo consumers, small balut dealers in Iloilo, such as Roselyn, resort to cheaper egg supplies, which are sold in other provinces like Pampanga.

Importing supplies from provinces such as Bulacan and Pampanga was seen as a better option than buying from local sources in Iloilo. While there is a limited number of local balut makers in the province, balut products are more expensive. The Philippine Council for Agriculture and Aquatic Resources Research and Development (1991) has identified marketing channels utilized in the distribution of duck eggs in the country. First, Figure 3 presents the model of the flow of distributing processed eggs (e.g., balut, penoy, salted eggs) into different actors in the industry. The informant Roselyn started off as a balut a vendor and later decided to establish her own business. She recalled, "At first, I was selling as a balut vendor and then later on we discovered that we could also sell fresh eggs." Some members of the industry, such as Roselyn who has multiple functions, allow a shortened process of the marketing and distribution of products.

Consumer demands and attitudes towards balut

Street food has been recognized by the FAO (2009b) as ready-to-eat food and beverages sold along the streets and other public spaces. This kind of food is commonly sold on makeshift stands or stalls along the sidewalks evident in both rural and urban areas (Steyn et al. 2011). Street food is known to become popular as low-cost alternative sources of nutrients (Karsavuran and Ozdemir 2017), mainly in low-and-middle-income communities. One of the common street foods found in the Philippines is balut. This snack is prepared by incubating duck eggs for about 18 days. As part of the Filipino food tradition, it has become popular among various age groups. Figure 4 below presents the current age range of consumers and the age range when they started eating balut.

Figure 4 presents that most of the selected consumers in Iloilo started eating balut among the age group of 9 to 13 years old (38%); it is closely followed by the 14 to 18-year-old age group (36%). It could be inferred that the accessibility and availability of balut as a street food has been a determining factor in its popularity among age groups. Balut vendors can be commonly found along sidewalks or roaming around the neighborhood during the afternoon until early dawn the following day (Fernandez 2002).

The consumption of street foods such as balut is determined by a variety of economic, nutritional, and cultural factors. Figure 5 includes several reasons for balut consumption among selected consumers in the province of Iloilo. The graph indicates several reasons for consumption including taste (*lasa*), nutritional value (*sustansya*), strength (*pampalakas*), curiosity (*kuryosidad*), peer

influence (*pinilit*), snack (*pulutan*), and local beliefs (*paniniwala*). The selected consumers in the province of Iloilo are identified according to their sex, comprising 48% male and 52% female.

Balut has been recognized in different countries for its role as a means of extreme gastronomic challenge (dela Torre 2002). It was used in various reality television shows such as Fear Factor. It has also been included in the 'disgusting and terrifying food list' (Calderon 2014) but is still considered a delicious snack for its consumers. The preference for street food among selected consumers in Iloilo is mainly reliant on its taste and nutritional content. Consumers who answered taste as their primary reason for balut consumption comprised 76% of the total selected consumers; followed by nutritional value with 42%. Balut and other duck egg products are popular because of their unique taste and high nutritional value (Boquet 2017). It is known that ducks have higher nutritional contents (Metzer 2012) compared to chicken eggs that are more widely consumed. However, duck eggs are also negatively linked to higher levels of cholesterol content than chicken eggs (Arthur et al. 2015).

The consumption of balut has also been strongly associated with the notions of strength and energy boost; 22% of the total selected consumers affirm this belief. Some consumers are patronizing this snack with the idea that it helps in strengthening their knees for more stamina and other medicinal properties (Abbugao 1985). This belief is more prevalent among the male population of the selected consumers, yielding 33.3%, while only 11.5% of the females adhere to such belief. Its consumption has been traditionally linked to the notion of 'masculinity'. As such, while considered to be exotic food, balut is also believed to be an aphrodisiac (Rijke 2008; Sanceda et al. 2007), making it more popular among men. This notion could be dated back as early as the arrival of Spanish colonizers in the Philippines in 1521 (Magat 2002) since Spaniards are known to introduce the concept of 'machismo' into the Filipino culture.

ENVIRONMENT AS A CONTEXT

Agriculture and duck farming

Agriculture is considered a crucial sector in attaining poverty reduction (Jha and Chakrabarti 2017). In 2015, it is estimated that about 56% of Filipinos are living in rural areas and are highly dependent on agricultural activities (Dikitanan et al. 2017); while farmers and fisherfolks mainly remain in poverty. In many Asian countries, integrated rice-duck farming has been implemented as a part of a sustainable agricultural movement (Suh 2014). It was introduced in Bangladesh in 2001 (Salahuddin 2005), and Cambodia also implemented a similar system (FAO

2009a). This system encourages the use of ducks as 'fertilizers' in growing rice (Pacamalan 2001), contributing to the increase in productivity and income, chemical-free rice and duck products, as well as the improvement of the quality of life of the farmers (SunStar Philippines 2014).

Duck farming and duck egg production in the province of Iloilo may be reliant on a variety of environmental factors rooted in economic and political factors. In an agricultural area such as Iloilo, the harvesting season is a determining factor in the laying period of ducks. The ducks can freely roam around fields and feed on rice husks for food during the harvesting season. Roger, a duck farmer, explained "*Problema lang diyanpag tag oras na ng tag tatanim ng palay. Pag wala kang ano ba...malalagyan ng pakawala ng mga itik. Yun...mahihinto yung pangingitlog nila*" (The problem is that when it is the planting season, and you would not have space for ducks to roam around. The egg production will stop). The lack of enough space designated for raising ducks contributes to the fluctuations of duck production. Ducks have been considered as most advantageous, as it requires inexpensive, minimal housing facilities, and less space for rearing (Chang et al. 2003) yet these problems still affect the ducks.

Climate and topography

The Western Visayas region has a Type I climate (Philippine Statistics Authority 2019). The climate of Iloilo Province is relatively dry from December to June and relatively wet from July to November. Apart from the seasonality of rice harvesting, climatic conditions may also be a determining factor in duck mortality and egg production. Changes in temperature and rainfall patterns will have an impact on agricultural production which in turn will threaten food security (Vogel et al. 2013). It may result in outbreaks of pests and diseases in plants as well as reduction in the number of fish. One of the informants, Roger, who is a duck farmer explained, "*Yung sa tiyempo rin ba...kung minsan namamatay pag init nang init tapos pag nakalabas sila satubig, mainit yung tubig. Yung parang di na makalakad...napipilay. Tapos minsan ang*

leeg bumabaliktad" (In climate...sometimes the ducks also die because of too much heat and even the water is too hot for them. The ducks could not walk like they have sprained their legs). The problem is aggravated during the monsoon season and during typhoons. In a country such as the Philippines, the occurrence of several typhoons in a year is common. As Roger, who is a duck farmer, recalled "*Ah wala naman problem asa...ah yung problema lang talaga pag yung may mga bagyo...yan. Pag may bagyo ano...lalo na pag doon sa Luzon ang bagyo tapos nasisira ang mga farm nila, apektado kami dito.*" (The only problem is when there is typhoon. When there is a typhoon especially in the Luzon area and their farms are destroyed, we are also affected here). The Philippines have been considered as the third most disaster-prone country according to the 2017 World Risk Index of the United Nations (Relief Web 2017). The significant decrease in GDRP of the region from 7.7% in 2011-2012 to 4.1% in 2012-2013 was primarily attributed to the effects of the Super Typhoon Yolanda (internationally known as Haiyan) in November 2013 (National Economic and Development Authority 2017). It resulted in an estimated 1.1 million houses being damaged, 33 million coconut trees destroyed, and about 5.9 million workers affected (World Vision 2013). Balbina who was a balut maker from the municipality of Ajuy since 1983, has also been affected by the typhoon. According to her, "*Wala eh, minsan nga pamangkin ko, binigyan ako noon ng pampaayos ng balutan kasi nasira ito noong Yolanda. Nasira lahat. Binigyan ako ng pamangkinko ng paggawa ng balutan kaya naka operate kami man. Maayosang balutan, walanaman kami kapitalmabili ng itlog (laughs)*" (It was my nephew that helped me in fixing my balutan because it was damaged during the typhoon Yolanda. Everything was destroyed. My nephew gave me money to repair my balutan and that is why we were able to operate again. It was fixed but we do not have capital to buy eggs). The typhoon caused the loss of her main source of living and she was only able to regain it through the help of her relatives. However, it can be difficult for other local businesses to revive their respective source of living.

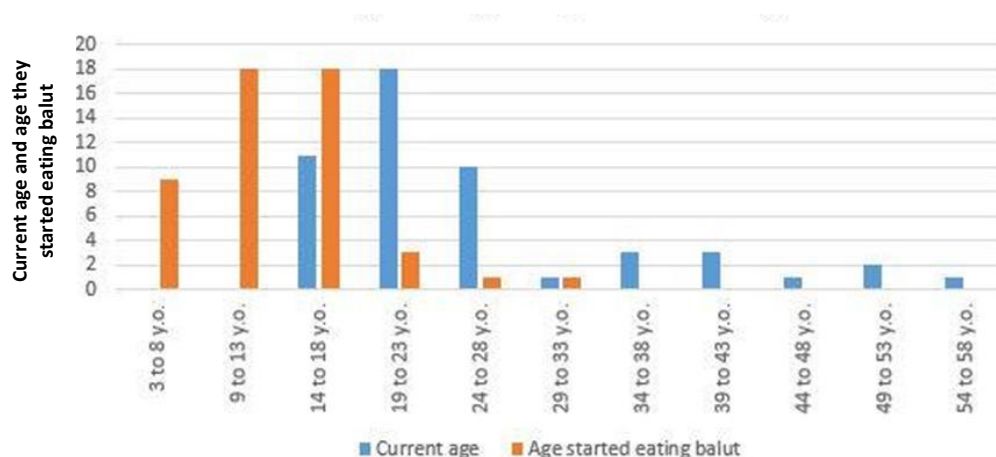


Figure 4. Age demographics of selected consumers in Iloilo, Philippines.

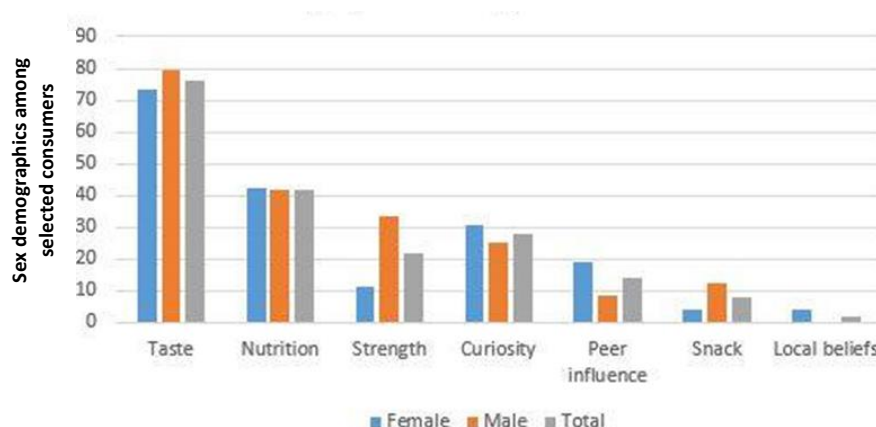


Figure 5. Sex demographics among selected consumers in Iloilo, Philippines.

Watershed and water access

Two of the largest watersheds in the province are the Maasin Watershed Forest Reserve and the Jalaur River Watershed Forest Reserve. The Maasin Watershed primarily supplies an estimate of 55% of the total potable water in Iloilo city and its adjacent municipalities through the Metro Iloilo Water District. The Tigum River is located in Sta. Barbara supplies the water in the towns of Oton, Cabatuan, Pavia, Sta. Barbara, San Miguel, and Maasin. The availability of water supply in agricultural areas is recognized as a key factor in the outcome of production. In Iloilo, water has been known as the main constraint in achieving high productivity (Philippine Institute for Development Studies & Bureau of Agricultural Research 2004). The primary system of irrigation in the province was an individual system followed by communal sources and others (Philippine Statistics Authority 2004). Dry season and droughts significantly affect the amount of water in the watersheds and dams, which will then impact irrigation systems of farmers—resulting in a decrease in agricultural production. According to an informant, Demfred, “*Hindi man tamaka init, hindi man...tubig problema diyan sa itik. Katamtaman lang ang init ng tubig. Tubig ang importante. Pag walang tubig hindi sila makatuka sa karamnan*” (The temperature is not suitable for the ducks...the water is the problem. Water is important. If there is no water, the ducks cannot eat). In duck farming, it is important to ensure that the ducks have enough water supply, especially during the dry season. The limited availability of water has also been made difficult due to the El Niño phenomenon (Greenpeace 2007).

Impacts of bird flu outbreak

Ducks have been recognized as the most resilient fowls when it comes to various environmental conditions and illnesses (Adzitey and Adzitey 2011). Still, ducks could get affected by a variety of factors. Highly pathogenic avian influenza (HPAI) is a widely recognized virus that is known to have started in southern China in 1996 (Gilbert et al. 2007). The virus has rapidly developed and has now about 102 genotypic variants (Su et al. 2015) at present; it is also known to evolve into subgroups during the breeding

period (Kwon et al. 2016). In 2017, a H5N6 avian influenza or bird flu outbreak hit the municipality of San Luis in the province of Pampanga in Central Luzon. An estimated 37,000 birds died and about 600,000 birds (e.g., chicken, duck) were culled to prevent further spread of the disease. Ferdinand, who is a balut dealer in Iloilo city, has recalled:

F: Ay hindi man, diba noong nakaraan yung ano...birds flu. (Before there was a bird flu)

T: Naapektuhan po kayo noon? (Are you affected by that?)

F: Tatlong buwan kaming walang benta ditong balut. (We did not have profit for three months)

T: Tatlong buwan po? (Three months?)

F: Oo, walang benta ng balut. Tapos nag supply sila galing Maynila, luto na. Pag dating dito, baho na. Yun ang laking lugi namin noon. (Yes, we cannot sell balut. Then, when they supplied from Manila, it was cooked already. When it got here, it was already spoiled. We suffered huge losses that time)

The bird flu outbreak has caused balut dealers, such as Ferdinand, to lose profit for three months. As balut dealing is his primary source of living, he had no option but to continue his business to compensate for his economic losses. The Department of Agriculture (DA) has also issued a ban on transporting any bird products from the province. While most of the balut supply in Visayas is from Pampanga and nearby provinces, the bird flu outbreak also affected local businesses in Visayas and Mindanao. The DA has started to implement an Avian Influenza Protection Program in 2007 in response to further threats in the country (Philippine Institute for Development Studies 2017), yet it has been criticized for its lack of stronger implementation of policies during such outbreaks.

Politicization of the environment

The province of Iloilo is recognized as an agricultural area where majority of the livelihood is relying on the agricultural sector. As such, several policies implemented are directed to improving the agricultural sector of Iloilo. The Republic Act 10068 or the Organic Act of 2010 is

focused on adopting organic agriculture in the country with the aim of increasing rice productivity, improving soil fertility, and reducing pollution in the environment (The LAW Phil Project 2010). The local government is aiming for a shift into organic farming as a part of its goal of turning it into an agribusiness economy. In rice farming, the Rice Industry Modernization Act (R.A. 11203) addresses the concern of improving the rice industry to boost the economy. The newly implemented rice tariffication bill aims to remove tariffs on imported rice to reduce its price on the local market. While its goal is to provide cheaper rice, it could potentially remove the livelihood of many Filipino farmers.

The Philippine Clean Water Act of 2004 or the Republic Act No. 9275 aims to address the protection, preservation, and revival of water resources to achieve economic growth. In the province of Iloilo, the waterworks system was initiated in 1926 (Commission on Audit 2018) resulting in the establishment of the Iloilo Metropolitan Waterworks (IMWW). The Metro Iloilo Water District (MIWD), which started in 1978, provides potable water to Iloilo City and its surrounding municipalities, including Maasin, Sta. Barbara, Pavia, San Miguel, Oton, and Leganes. The MIWD primarily acquires its supply from the Metro Iloilo Bulk Water Supply Corporation (MIB) (Metro Pacific Water 2017). At present, several private companies are responsible for delivering water supply to several municipalities. In the municipality of Sinuagan, the Sinuagan Water System regulates its water supply. An irrigation plan, called Barotac Viejo Small Reservoir Irrigation Project (SRIP), has been implemented to address the need for better water systems for local farmers. Water supply is primarily collected from nearby dams and rivers such as the Tigum River. However, two primary concerns in water access includes: (i) diversion of supply and (ii) unaffordability of water (Rola et al. 2015). The insufficient amount of water and inefficiency of the water delivery system has been both recognized as problems in Iloilo.

Issues and adaptations

The Iloilo duck and duck egg industries are highly embedded in environmental conditions such as climate and water supply as well as the harvesting season. In an agricultural area such as Iloilo, the harvesting season primarily determines the availability of feeds and space for the rearing of ducks. Ducks can feed on natural food sources such as rice and corn when there is harvest. Meanwhile, the ducks are being displaced from the rice fields during the planting season; thus, affecting the egg production of ducks.

The province is one of the high-risk areas for disasters, particularly in flooding in the Philippines (ABS-CBN News 2013). It also experiences long periods of dry season annually. As such, it will pose some difficulties in the production, incubation, and transportation of duck eggs. The condition of the ducks is highly determined by the seasonal fluctuations and the availability and quality of water. Harsh weather conditions will result in ducks getting sick, which may sometimes also lead to death. Selected duck raisers also believe that the temperature of water may

also contribute to the vulnerability to diseases. Instances of typhoons often also affect the transportation of duck eggs. For Iloilo, which hugely relies on the supply coming from Luzon, the transportation process will be crucial.

To address the issues in the duck industry, duck farmers and balut dealers utilize several coping strategies. During the planting season, the farmers place their ducks in small enclosures in their respective backyards. When there is no rice or corn, the duck farmers are unable to feed their ducks since commercial duck feeds are not available. In periods of typhoon, it will be difficult to transport the eggs through cargo ships from Luzon. In that case, some balut dealers opt to have their supply delivered through air cargo. While this is considerably safer and faster option, it is known to be more expensive. According to Ferdinand, it requires an additional Php1 for each egg that will be delivered.

SOCIAL ORGANIZATION AND THEIR ROLE IN SUSTAINABILITY

Existence of formal and informal groups

In the Iloilo local duck and duck egg industries, the existence of formal or informal groups among local duck farmers could be considered minimal. The practice of duck farming in the province has been established for many years, yet it is still lacking in terms of organizational structure. From the selected informants, one has affirmed the existence of a formal organization. Lito is a duck farmer who started his business in 2012. It was after five years that a local cooperative for duck farmers and balut makers was established, known as San Lucas Balut and Salted Egg Makers. It was a government-initiated program that provides seminars for local duck farmers and balut makers with 35 members at present. As Lito recalled, "*Eh yung asawakonakapagsa training ba. Eh naka SLP. Tapos yung tray namindiyan...binibigyannaman kami ng kapital para pambili ng itlog at tsaka incubator*" (My wife was able to receive training from San Lucas group. Then we were given capital to buy eggs and an incubator). The program also aids in financial expenses by providing capital to start up their own balutan businesses. Currently, the wife of Lito serves as the president of the cooperative.

Role in duck farming and duck egg production

The existence of formal and informal groups is a determining factor in achieving the sustainability of each local business and the overall industry. Cooperatives are being recognized as 'catalysts of change' (The Manila Times Online 2017) for many local livelihoods and industries. Formal groups, such as the San Lucas group, provide assistance for their members through the selling and distribution of their products. It gives certainty that each member will be able to sell off the balut and salted eggs and that they will gain income on a regular basis. Then during off-season and calamities, an organization provides business owners with the necessary assistance they require. The San Lucas group conducts regular meeting sessions monthly to discuss and address issues affecting the duck industry. As Lito explained, "*Para*

makwanangproblema, masolusyonan... sapinansiyalamon na kwarta. Tapos among nakalubongitlog...nakakwansa incubator" (It helps in resolving our problems... especially in finances). Meetings enable each member to monitor the status of their own businesses and the situation within their local community. Cooperation and interactions taking place within groups are necessary for their survival (Asçi et al. 2015; Bruni et al. 2008).

Intersections between producers, suppliers, and vendors

The local duck industry in the province of Iloilo is primarily comprised of duck farmers, balut suppliers, balut retailers, and balut vendors. The duck farmers serve as the producers that supply small-scale balut and salted egg businesses or directly sell fresh duck eggs in the local market. Moreover, the balut suppliers are usually from the Luzon particularly in the provinces of Pampanga and Bulacan. They process the fresh eggs into balut, penoy, and salted egg; the products will then be delivered to Iloilo through a cargo shipment. The balut retailers will collect the duck products and then sell them to vendors for a higher price. A balut retailer, such as Roselyn, employs her own vendor. They start selling at around one in the afternoon and finish at about nine in the evening. Other vendors will buy about a hundred balut on a normal basis and sell it during nighttime along sidewalks and other establishments. To maintain such business, owners must secure a consistent supply of products daily. This is where the producers, suppliers, and vendors enter a 'suki' arrangement. This localized Filipino term emphasizes the agreement between two individuals to become regular buyers and suppliers (Dolan 1991). An informal agreement will be established to ensure that they would constantly acquire supplies from them. The informal nature of the suki arrangement poses an uncertainty on how long they will remain in such agreement. In the case of Roselyn, they sign some form of 'consignment' as a formality binding them with their balut supplier.

Intersections with government agencies

Government interventions in the agricultural sector are recognized as a determining factor in sustainability. In Thailand, the government implements a rice price policy to regulate pricing—where farmers are provided with a fixed minimum price for the rice (Forsell 2008). Meanwhile, the Cambodian Government established the "Paddy Rice Production and Promotion of Milled Rice Export" in 2010 (Socheth 2012) with the aim of achieving more rice production through investment in irrigation facilities, private sector investment in exportation, and improving exportation processes. Vietnam also implemented the Agricultural Restructuring Plan (ARP) in 2014 (World Bank 2016) with the goal of increasing economic value and farmer and consumer welfare by using less human capital and less harmful inputs.

In the Philippines, government initiatives have also been implemented to support local industries such as duck farming and balut-making. The Philippine Council for Agriculture, Aquatic and Natural Resources Research

Development under the Department of Science and Technology (DOST-PCAARRD) is in the municipality of Los Baños. In 2017, this government agency, in partnership with the National Swine and Poultry Research and Development Center of the Bureau of Animal Industry (BAI-NSPRDC), initiated the project called 'ItikPinas' which aims to address issues of inconsistent duck egg production and low product quality by introducing a genetically superior breeder 'itikpinas' (IP)(DOST-PCAARRD 2017). Meanwhile, the selected informants in the province of Iloilo have not yet been part of this project. Only the SLP in the municipality of Barotac Viejo has been able to seek assistance from the government sector.

Issues and adaptations

The local duck and duck egg industries of the province of Iloilo have been characterized by informal forms of negotiation and minimal support from government agencies. The province is recognized as the top duck-producing region for small-scale and backyard producers. However, it is still considered lacking in terms of organizational structure. The San Lucas cooperative has the only government-initiated program that has been accounted for in the interviews among the selected informants. However, it is mainly limited to the local duck farmers in the barangay of San Luis. As such, the absence of strong formal organizations and government initiatives for all stakeholders in the industry poses a threat to the stability of the industry.

The lack of formal organizations to support and regulate egg production among local duck farms have resulted in a network of suki arrangement among producers, suppliers, and retailers. The local duck farmers and balut makers then primarily depend on each other for the survival of their respective livelihoods. The issue of selling and distribution of duck egg products has been a common concern among many local businesses. Ferdinand, who is a balut dealer in Iloilo city, commonly experiences losses in his income brought about by the difficult transportation. As he recalled:

"F: Mayroontalagangmalalambot. Sa biyahe, maraming basag. (There are real eggs that are soft. During the transportation, there are many cracked eggs)

T: Ano pong ginagawaniyopagganunpo? (What do you do when that happens?)

F: Wala, tapon na. tapon na. (Nothing. We just throw them into waste)

T: Maramipobanasayangpagganun? (Is that usually many?)

F: Oo, noongnakaraanglinggo lang angnasayangsamin sampung kahon(Yes, last week about 10 boxes were wasted)"

According to Ferdinand, each box consists of about 300 baluts and penoy. In cases like this, he cannot hold the producers liable for his economic losses, as they have an informal arrangement. As such, he will increase the prices of his products to gain back some profit. Without assistance from formal groups and cooperatives, it will be difficult to sell off and transport products.

THE TRAJECTORY OF THE ILOILO INDUSTRY

Issues of Sustainability vis-à-vis partner interventions

The landscape of the duck and duck egg industry in the province of Iloilo emphasizes the lack of initiatives from non-government and government institutions. The selected producers, operators, and retailers were mainly relying on informal arrangements such as 'suki' to maintain their respective businesses and the industry. This poses a challenge for members of the industry. One of the informants, Demfred, has complained:

"D: Kung may kapital, pautangin kami (laughs) financial. (If there is capital, they could loan us some money)

T: Mgakooperatibapo? (Cooperatives?)

D: Oo, mapadami pa naming angmag-iitiknamon no. (Yes, so that we could increase our duck farms)"

For small-scale duck farmers, such as Demfred, it is difficult to improve the number of his ducks without assistance from an institution or any other formal groups. Loans and other membership benefits from an organization will provide capacity-building for each duck farmer and balut maker. There is a need to address the problems of local duck farmers in the province of Iloilo to sustain its own balut industry. Without such interventions, the local industry will still be reliant on importing supplies from provinces such as Pampanga and Bulacan in Central Luzon. Government-led initiatives such as the ItikPinas have not yet been known by the selected small-scale duck farmers. This initiative aims to increase the productivity level by introducing a new breed of duck, which could potentially improve the farming businesses, particularly small-scale producers.

Consumer projections for balut as a product

The consumption of balut as a street food mainly in Iloilo City has been strongly linked with its unique taste and nutritional value. Selected consumers have identified balut as an affordable source of protein and energy boost. Balut has been familiarized in many countries as a form of extreme challenge as exhibited by several television shows (Matejowsky 2013). However, balut as a Filipino product has not yet been properly introduced in the global food market. Seventy-six percent of the selected consumers in Iloilo have affirmed making balut and other duck egg products as export products of the country. This could potentially boost the national economy and at the same time present the rich Filipino food culture. Fourteen percent of the selected consumers answered yes with reservation, while the remaining 10% answered no. Accordingly, it is important to consider several factors such as the continuity of supply, egg quality, and the health concerns of different countries against balut consumption. Meanwhile, 16% of the consumers answered yes with reservation. While this could be advantageous, it is important to consider several factors such as the egg quality and the health concerns of different countries against balut consumption. This primarily signifies the need to address such issues in the local balut industry

before starting to introduce balut as an export product. It has been discovered that street food vendors in Iloilo are implementing minimal hygienic and sanitary practices (Calopez et al. 2017).

POLICIES, IMPLEMENTING RULES, REGULATIONS AND RECOMMENDATIONS

This study has provided a brief overview of existing policies concerning the agricultural sector and water usage in the Philippines. Policies such as the Organic Act of 2010 and Rice Modernization Act were policies directed towards the modernization and transformation of the agriculture sector into an agribusiness economy to boost economic growth. Existing policies implemented on water usage were primarily limited in Iloilo City and its neighboring municipalities. There is a lack of policy and initiatives from formal institutions in addressing the needs of agriculture as well as duck farming. The current condition of the duck and duck egg industries of the province of Iloilo requires support and interventions in order to attain its sustainability. This study recommends a review of existing policies to identify the needs of local industries such as the duck and balut industry. There is an evident need to provide assistance for small-scale farmers by giving them more capital. This could be a significant move towards capacity-building for each member of the industry. Additionally, attaining higher level of capacity could potentially reduce the dependency of the Iloilo industry on balut production in Luzon provinces. Finally, this could be a significant contribution to developing capacity-building for the sustainability of each business and the industry as a whole.

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