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Opportunities and Risks of Cacao Farming Business In the Province of Zamboanga Del Norte

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Abstract — This study sought to find out the opportunities and risks of cacao farming business in Zamboanga del Norte, Philippines through a survey of local farmers. The study analyzes the profile of the cacao farmers, farm characteristics, operations expenditures, and perceived opportunities and risks of cacao farming business. Findings reveal that while smallholder farms are prevalent, with limited output currently meeting local demand, the potential for growth is significant. The study concludes that the province's favorable conditions, including clay loam soil and a growing market, present more opportunities than risk.

Keywords — Cacao farming, cacao business, opportunities, risk, agricultural business, sustainability

I. Introduction

The risk and opportunities associated with cacao farming make the latter a complex process. A high price crop "treasured by ancient civilizations" for thousands of years (Martin, 2016), cacao currently supports a "multibillion-dollar trade that is concerned with the production" of cocoa – or cocoa bean – derived chocolate appreciated worldwide - and its "commercialization"(Teixeira, Thomazella, & Pereira, 2015) (ICCO, 2018). However, the supply and demand gap of cocoa beans is increasing as cacao production specifically in the West African region, the top cocoa producer, has been falling since 2012, (Philippine Cacao, 2017). This is in spite of the fact that every year, an estimated "3 million tons" or more of "cocoa beans" are being produced worldwide" mostly by smallholder farmers in areas of high biodiversity" (Teixeira, Thomazella, & Pereira, 2015).

Moreover, the growing global demand represents an opportunity for the Philippines to grow the economy; its geographic and climatic conditions are suitable to cocoa production on a large scale. The country too is strategically located as well, due to its "proximity to growing markets" (Department of Trade and Industry, 2017). To address the challenge of global decline of cocoa production, the Philippine government pushed for the engagement of individual farmers and cooperators in cocoa production, through the Philippine Cacao Challenge 2020 (CIDAMi, 2016). Its main goal is to become one of the world's top producing cacao countries - translating its output into better livelihoods at the farm level, increased resources and investment at the national level, and a safer, more secure environment for smallholder farmers – farmers that supply the bulk of cocoa production for the world's consumers.

Despite its competitive advantage, and the millions of cacao planting materials that had been distributed and cultivated since 2014 through Department of Environment and Natural Resources–National Greening Program (DENR-NGP), Department of Agriculture-High Value Crops Development Program (DA-HVCDP) and the Philippine Coconut Authority-Kaanib Program (PCA-Kaanib Program)(Philippine Cacao Council, 2016), however, Philippine cacao production is still considered insignificant, producing only at 6,020 MT from the13,910 hectares (ha) of land planted with cocoa (Philippine Statistical Authority, 2015).

It is in this light that this study is looked into the opportunities and risks of the cacao farming industry in the province of Zamboanga del Norte. Results of the study served as bases for recommending possible policy formulations at the local level to strengthen Zamboanga del Norte's cacao industry – and for the possible formulation of the Provincial Cacao Roadmap – Zamboanga del Norte's cocoa production initiative will provide farmers with the necessary tools and resources to take advantage of the rapidly increasing global demand for chocolate or cocoa. This initiative will create economic opportunities for the Philippine chocolate and confectionery industries in Zamboanga del Norte, as the province turns its cacao farming businesses into engines of growth and socio-economic development.

Literature Review

The global cocoa-chocolate value chain (GVC) presents a multi-million dollar opportunity for developing countries like the Philippines. However, despite possessing favorable climatic conditions and a history of cocoa production, the Philippines' participation remains limited, holding a minuscule global market share of less than 0.01% (UN Comtrade, 2016). This underperformance stems from several key challenges. Specifically, global demand for cocoa far outstrips supply (ICCO, 2016, 2018; CIDAMI, 2016), creating a significant price imbalance. While this presents a lucrative opportunity, the Philippines struggles to capitalize due to limitations in cocoa bean production. Consequently, low-quality seedlings, inefficient farming practices, and limited access to capital and training hinder output (Department of Trade and Industry, 2017). Furthermore, an aging farming population and rural-urban migration further exacerbate the problem, resulting in insufficient domestic beans to support either domestic consumption or export-oriented grinding (Hamrick et al., 2017).

Adding to these production challenges, the cocoa GVC is characterized by an imbalance of power, with aggregators and exporters holding significant control over the market (Department of Trade and Industry, 2017). As a result, smallholder farmers, who constitute the majority of producers, are often fragmented and lack the bargaining power to secure better prices for their beans. This lack of bargaining power, coupled with the Philippines' low cocoa bean production, constrains its ability to participate in higher-value processing stages within the GVC. In fact, grinding capacity is limited, and the number of large-scale grindings firms is shrinking (Hamrick et al., 2017), hindering the country's potential to capture greater profits from value-added products. Although the growing popularity of cocoa-based products like tsokolate (tablea) presents a

domestic opportunity, this market is not large enough to significantly impact the country's overall participation in the global GVC.

Despite these significant challenges, significant opportunities exist for the Philippines to enhance its position in the cocoa-chocolate GVC. Indeed, the widening global supply-demand gap offers a chance to capture a larger market share. For instance, a 10% share of the world supply alone could generate substantial income for the country and its procedures (Philippine Cacao Council, 2016). To realize this potential, focusing on improving farm-level productivity, investing in training and technology, and strengthening farmer cooperatives to improve market access are crucial steps. Encouragingly, the government's increased focused on the sector, recognizing the country's climatic advantages, is a positive sign. However, effective policies to address the supply chain bottlenecks and market power imbalances are essential to ensure that the Philippines can fully leverage the global demand for cocoa and participate meaningfully in the cocoa-chocolate GVC.

This need for effective policy is underscored by the fact that the Philippines cocoa industry is experiencing a resurgence, with production volumes increasing since 2006 (Dir. Jennifer E. Remoquillo, 2015). Government initiatives such as R.A. 7900 (High Value Crop Development Program Act), prioritize cocoa production intensification, and growing local and international demand has spurred increased farmer interest (Dir. Jennifer E. Remoquillo, 2015). However, despite this progress, domestic supply significantly lags behind demand, with local production meeting only 25% of the 40,000 MT annual demand (Bureau of Agricultural Statistics, 2017). Specifically, Davao Region accounts for a dominant 80% of the 10,000 MT annual output, while other regions contribute smaller percentages, Cagayan Valley at 4%, Northern Mindanao Region at 3%, and ARMM, MIMAROPA, SOCCKSARGEN, and Zamboanga Peninsula Regions at 2% each. Caraga, Ilocos, CAR, Central Luzon, Bicol, Central, Eastern and Western Visayan Regions each contribute 1% (Bureau of Agricultual Statistics, 2017).

Recognizing the need to bolster the industry and capitalize on the projected global cacao deficit, Senator Grace Poe introduced senate resolution No.920 Poe, Grace, 2015. This resolution ,citing the 1987 Philippine Constitution mandate to promote sound agricultural development and agrarian reform Article XIII, Section 5,1987 Philippine Constitution , urged the senate Committee on Agriculture and Food to investigate the industry's status and formulate supportive legislation .In response to this , the resolution proposed leveraging funds like the Agricultural Competitiveness Enhancement Fund (ACEF) and High-Value Crops Developing Funds to provide credit and support farmers (Poe, 2015). Building on this momentum, further legislative support came from Senator Cynthia A. Villar's Senate Bill No.320 aiming to revive the cacao industry and facilitate participation in international markets. This bill proposed national program led by the Department of Agriculture, focusing on stakeholder education, research technology transfer, international linkages, and market competitiveness (Villar, 2016).

These legislative initiatives have been complemented by concrete collaborations between government agencies and the private sector further demonstrating a commitment to cocoa industry development. For example, the Department of Agrarian Reform (DAR) partnered with Kennemer Foods International, Inc., under a "Cacao Production and Purchase Agreement", to support Agrarian Reform Beneficiaries (ARBs) in Mindanao (Sun Star Philippines, 2013). This involved consolidating production through block farms, providing ARBs with access to global market, and fostering sustainable agribusinesses. Moreover, in 2015, five ARBOs in Zamboanga del Norte utilized an ₱88 million loan from the land bank of the Philippines (LPB) under the Agricultural Production Credit Program (APCP), with DAR assisting in loan application (Adju, 2018; DAR, 2013).The APCP, a collaboration effort involving DA, DAR, DENR, ACPC, and LPB, provides flexible credit to ARBOs for various agricultural activities (Land Bank of the Philippines, 2018). Subsequently, initiatives included a P16 million allocation from the department of agriculture (DA) in 2016, distributed among Zamboanga del Norte, Zamboanga City, and Zamboanga del Sur for cacao planting materials under the DA High Value Crops Development Program (HVCDP) (Simeon, 2016). Finally, the 2017 Cacao Production and Marketing Enterprise project, funded by the World Bank through the–Philippine Rural Development Project (DA-PRDP), aimed to modernize the agri-fishery sector through infrastructure development, technology transfer, and information dissemination (Department of Agriculture, 2019). This project, implemented under PRDPs I-REAP program, involved a 45.5 million investment in Zamboanga del Norte, focusing on infrastructure, farming support and enterprise capital for processing and trading (Department of Agriculture, 2019). In short, these multifaceted efforts highlight a concerted push to revitalize the Philippine cocoa industry and address the significant gap between supply and demand.

Cacao, a globally significant crop and the primary ingredients in chocolate production (Department of Trade and Industry, 2017), holds a unique position in the global economy (Gayi & Tsowou, 2016). Its irreplaceable role in chocolate manufacturing (2021-2025 Philippine Cacao Industry Roadmap, 2022; Ramos, 2016), and its purported health benefits (DOST-PCAARRD, 2017) contribute to its economic importance. The Philippines, strategically located in Southeast Asia, possesses a competitive advantage in cacao production due to its favorable climate, soil conditions, and vast coconut farms suitable for intercropping (2017-2022 Philippine Cacao Industry Roadmap, 20217; Ramos, 2018; Business Diary Philippines, 2018). The inherent advantage is further enhanced by the rising consumption of chocolate in Asia, driven by increased incomes and Western lifestyle adoption, creating export opportunities, particularly to nearby markets like China (Ramos, 2018).

Projected global demand for cacao is substantial, with an estimated need of about "4.7 million to 5 million metric tons (MT) by 2020" coupled with a predicted shortage of 1 million MT. Domestically, annual consumptions stands at 50,000 MT, while local supply is significantly lower at approximately 10,000 MT. highlighting a substantial supply gap (2021-2025 Philippine Cacao Industry Roadmap, 2022; DTI-BOI, 2014). This presents a significant opportunity for Philippine cacao growers and manufacturers. However, this opportunity is tempered by the increasing

consumer demand for sustainably produced cocoa beans (UTZ, Rainforest Alliance, Fair Trade Certified) which presents a challenge. This demand is projected to increase from 100,000 tons in 2010 to 500,000 tons in 2020, requiring a significant investment from smallholder farmers who often lack the financial resources to meet these standards (2017-2022 Philippine Cacao Industry Roadmap, 2017). Furthermore, the unique price dynamics of cacao, where prices are higher during peak production seasons, defy traditional supply and demand principles (A Primer on PEF's Priority Commodities: Industry Study on Cacao: Philippine Cacao, 2017), presenting both opportunities and complexities for producers.

Beyond its primary use in chocolate, cacao offers diversified applications. Specifically, six intermediate products – cocoa nibs, cocoa liquor (tablea), cocoa cake, cocoa butter, cocoa powder, and chocolate confectionery blocks – can be derived from cacao beans, along with wet, dried, and dried-fermented beans. This versatility coupled with cacao's nutritional value (Philippine Cacao Industry Roadmap 2021-2025), expands market opportunities. The increasing popularity of cacao-based beverages in cafes and restaurants, both domestically and internationally, further enhances the market potential for tablea and other cocoa products. Moreover, the health and wellness trend positions cacao as health food, further driving demand (DTI-BOI, 2014). This confluence of factors has spurred calls for farmers to explore export opportunities to major international markets (Salazar, 2015), leveraging favorable international market trends and the growing domestic demand (Business Dairy Philippines, 2018). Consequently, the collaborative efforts of government agencies and the private sector aim to boost the cacao industry, creating livelihoods and contributing to economic growth, particularly in rural areas (Lihgawon, 2018). The ambitious goal is to increase production to "50,000 metric tons (MT) of quality fermented beans by 2025 to meet the demand of the export and domestic markets through a 40% annual increase in production" (2021-2025 Philippine Cacao Industry Roadmap, 2022).

The profitability of cacao farming is dependent on several factors. Initial investment costs are relatively low, with estimated costs per hectare ranging from PhP 61,148.00 for intercropping to 89,628.00 for mono-cropping (2021-2025 Philippine Cacao Industry Roadmap, 2022). Therefore, a promising return on investment (ROI) can be achieved within three years, with net income doubling in relation to production costs by the third year (A Primer on PEF's Priority Commodities: Industry study on Cacao). Nevertheless, ensuring the sustainability or production is crucial for long-term profitability. The growing interest in cacao farming among Filipino farmers is driven by favorable market conditions and increasing global prices (Business Diary Philippines, 2018). For example, in Zamboanga del Norte, intercropping cacao with coconuts is maximizing land use and boosting farmer income (DA-PRDP, 2018).

In addition to increased production, the Philippines' Farm Tourism Development Act of 2016 (Republic Act 10816) (Philippines, 2015) present an opportunity for cacao farmers to diversify their income streams. While farm tourism is not yet a major contributor to tourism receipts, it offers farmers a complementary business model, allowing them to generate income

through tourism packages that incorporate cacao cultivation , harvesting , and value-added product creation (Simeon,2016). Furthermore, the growing cacao and chocolate industry can significantly boost farm tourism, attracting both domestic and foreign visitors (The Philippine Star, 2018). Government support for farm tourism (Department of Tourism, 2018), and calls for cacao farmers to engage in agri-entrepreneurship and establish from schools (Palicte, 2018) further highlight this diversification strategy.

Despite those opportunities, the Philippine cacao industry faces several challenges. Specially ,the adoption of modern agriculture techniques remain low, hindering participation in the global value chain (Department of Trade and Industry, 2017).As a result ,many farmers rely on traditional practices, resulting in lower yields .Moreover ,limited financial capacity and access to capital prevent farmers from adopting modern techniques ,upgrading equipment ,and obtaining necessary certification (Hamrick et al., 2017).Adding to these difficulties ,the aging farmer population and the shift of younger generations to other careers pose a significant threat to the industry's long term sustainability (De Guzman , 2018; Ocampo, 2018).

High input costs, particularly fertilizer, represent a major obstacle .Soil erosion and nutrient depletion necessitate fertilization, but the high cost of imported fertilizers makes them unaffordable for many farmers (De Guzman, 2018). Consequently ,understanding fertilizer application based on the growth stage of cocoa trees is crucial for maximizing benefits (Conservation Alliance ,20153).Cacao disease and pests ,exacerbated by tropical conditions ,cause significant yield losses (Afoakwa, 2016),impacting both quantity and quality . The lack of adequate infrastructure, including farm-to- market roads, irrigation systems, dying facilities and milling centers, further hampers the industry growth (De Guzman, 2018). In addition the fragmented nature of smallholder procedures and the dominance of cocoa been aggregators and exporters limit economies of scale and bargaining power(Department of Trade and industry ,2017).Finally ,the aging farmer population ,with an average age of 57(De Guzman ,2018), and the global trend of declining young farmer participation in cocoa farming due to poor benefits (Fairtrade Foundation ,2020) pose a long-term demographic challenge. The educational attainment of Filipino farmers, with a majority being secondary school finishers (Briones, 2017), also needs to be considered in addressing the industry's challenge.

The global narrative surrounding cocoa production paints a complex picture. While agricultural growth, particularly in high-value crops like cocoa, has been strongly linked to poverty reduction in developing countries (Christiaensen et al., 2011; Grewal, Grunfeld, & Sheehan, 2012), the reality for cocoa farmers is often nuanced. Studies across various regions highlight the potential for increased income and improved livelihoods through cocoa farming (Obiri et al., 2017; Kalimang'asi et al., 2014; Sefriadi et al., 2011; Azhar & Lee, 2004), but also acknowledge significant challenges that hinder the achieve of these positive outcomes.

Studies from various countries illustrate the potential and pitfalls of cocoa production as poverty alleviation tool. In china, agricultural growth, including the success of the household

responsibility system, played a crucial role in initial poverty reduction (Grewal, Grunfeld, & Sheehan, 2012). Similarly, Ghana's economic transformation was significantly impacted by broad-based agricultural development, with agricultural growth contributing substantially to GDP growth (Diao,2014). However, these successes are often tempered by various constraints. Studies consistently point the significant impact of pests and diseases (Estelle,2015; Aneani et al., 2017; Sonwa et al., 2015), climate change (Ofori–Boateng & Insah, 2014; Gateau-Rey et al.,2018; Schroth et al.,2016), and limited access to credit and markets (Baloyi, 2010; Magesa et al., 2014; Quartey & Asamoah, 2018) as major obstacles to sustainable cocoa production and income generation. Furthermore, the labor-intensive nature of cocoa production and income generation. Furthermore, the labor-intensive nature of cocoa farming (Fahmid et al., 2018), coupled with declining interest among younger generations (Fahmid et al., 2015; Aphunu & Atoma, 2011; Adeogun , 2015), poses a long- term threat to industry sustainability. The relationship between farm size and productivity is also complex, with some studies suggesting an inverse relationship between farm size and output (Ahmad & Khan Qureshi, 2018; Yan et al., 2019), while others highlight the advantages of larger farms in terms of technology adoption and economies of scale (Arias, 2017).

The Philippine cocoa industry mirrors many of the global trends, with smallholder farmers forming the backbone of production (Amparo et al., 2018; Lingatong, 2018). While cocoa offers significant income potential (Nabua et al., 2013), and cooperative have demonstrated success in enhancing market access and efficiency (Sumalde & Quilloy, 2015), the industry faces similar challenges. Specifically , price fluctuations (Sarmiento et al ., 2015), labor constraints (Buan et al., 2014; Lingatong, 2018;Santiago & Roxas, 2015), high input costs (Lingatong, 2018), and limited access to credit (Geron et al., 2016; Limbo, 2017) remain significant hurdles .The potential of agri-tourism (Recio et al., 2014; Zacal et al., 2019) 0ffers a diversification strategy, but its impact on poverty reduction needs further investigation .Government intervention, such as the Cacao Challenge 2020 and various credit programs (Gereon et al., 2016), aim to address these challenges, but ultimately, the success of these efforts hinges on the implementation of effective and coordinated policies.

II. Methodology

Person involved in the survey questionnaires was the farmer himself to gather all the necessary information. Four (4) groupings were surveyed, namely: Members of the five Agrarian Reform Beneficiary Organizations who ventured in the cacao production under the DAR-Kennemer production and purchase agreement; farmers-cooperators who availed the Plant Now, Pay Later scheme of the DA – Philippine Rural Development Project in partnership with the three Multi-purpose Cooperatives – a Credit Cooperatives (PIMCO, POEMCO & FACOMA); Local Government Unit farmer – beneficiaries who participated in the cacao dispersal program, and the independent – self-financed cacao farmers.

A sample of 314 respondents from 1,149 was determined using Slovene's formula selected from the 12 component municipalities and one city which are currently concentrating on cacao farming and production as identified by the Department of Agrarian Reform through its Agrarian Reform Beneficiary Organizations (ARBOs), Provincial Rural Development Project (PIMCO, POEMCO & FACOMA), the Local Government Units with its Cacao Production Dispersal Program, and the Department of Trade & Industry who serves as the monitoring agency for the cacao production and processing in the Province for the independent cacao producers. The selection of the farmers was based on the following criteria: (a) must belong to any of the four groups of respondents included in the study; (b) availability of the farmer during the conduct of fieldwork; and (c) permission from the farmer to be included in the study. The farmers were randomly selected from the list provided by the Municipal Agrarian Reform Office for the Agrarian Reform Beneficiaries, Municipal Agriculture Office for the Local Government Unit's beneficiaries, Department of Trade and Industry for the independent cacao farmers, and for the Philippine Rural Development Project, the list of beneficiaries were provided by the three Multipurpose Cooperatives involved in the project implementation, namely PIMCO, POEMCO and FACOMA. Of the 314 copies of survey questionnaires, only 306 were usable, as the eight (8) others remained for the most part unanswered.

Printed questionnaires were the main data collection tool, supplemented by interviews with respondents. The questionnaire was pilot-tested on 43 cacao farmers who were beneficiaries from the Philippine Coconut Authority (PCA), LGU cacao dispersal program, and independent farmers. A value of 0.888 Cronbach's Alpha using the Siegle reliability calculator was obtained which is within the range of good reliability.

A Likert modified scaling type was used in this study to survey the perception of the farmers on the

relative degree of importance on the various farming activities – profitability, labor, production, investment and management - by asking the levels of opportunities or risks from a series of statements. This approach assumes some underlying subjective dimension such as the "degree of importance". Respondents were given the prospect to select from the four items in a choice set that maximize the difference between them on an underlying scale of significance.

III. Results and Discussion

Profile of the Cacao Business in Zamboanga del Norte

The study profiled 306 cacao farms in the province. Most (72.22%) were owned by the respondents and located in barangays with clay loam soil, which is suitable for cacao. This indicates that farmers are guided and aware of the soil requirement for cacao cultivation. Farms sizes were predominantly small, with a mean of 1.86 hectares. As mentioned in the Philippine

2017-2022 Philippine Cacao Industry Roadmap, 90% of existing farms devoted to cacao cultivation are practically small in terms of land size. This ownership profile holds true even in the global scenario where most cacao farms are also small, ranging from 1-3 hectares (Bureau of Plant Industry, 2016). Planting density averaged 703 trees per hectare, thereby exceeding the PCA recommendation of 600. The cacao tree – which produces the cocoa bean – is fragile, capable of growing only in a narrow band 15 degrees north or south of the equator.

As with other "orchard" crops, cocoa farming requires time, with cacao trees yielding their first pods approximately two to three years after planting (International Cocoa Initiatives). However, the farmer-respondents planted the Philippines cacao clone varieties that can start to flower before it reaches 2 years from planting such as the NSIC-Cc-99-01 (ICS 40) which generally start to flower at the age of 17.63 months, which fruiting follows at 19.63 months, while NSIC Cc-99-05 (BR 25) first flowering starts at 16.12 months and fruiting follows at 17.70 months. Whereas NSIC Cc-99-06 (K1) start to flower at 23.20 months and bears fruit at 25.10 months and NSIC Cc-99-07 (K2) start to flower at 21.10 months and bears fruit at 24.12 months (Department of Agriculture). Despite planting these high-yielding varieties, and having mostly mature trees (3-4 years old at most), only 14.71% were fully productive, the remainder were still flowering. These are partly attributed to the non-application of the farm inputs on the specified frequency due to the delays in the releasing of fertilizers, pesticides and other farm inputs to the program beneficiaries.

Cocoa farmers' investment decision in cocoa farming in the cocoa value chain is an essential factor

towards the development of the cocoa sector (Segun, 2016). Comparable to cultivating fruit bearing trees and other high value crops, the possibilities of high yields and income from cocoa is generally anchored on the amount of investment from land preparation to harvesting (A Primer on PEF's Priority Commodities: Industry Study on Cacao). In the Province, most farmers (64.38%) invested an averaged of ₱100,000 per hectare, yet 63.07% earned less than ₱100,000 annually from the sales of cacao beans, while DTI estimates that the projected gross annual income of beyond ₱100, 000.00 is expected only in the seventh year onwards. The province very minimal farm output from 2016 to 2020 was not enough to supply the local grinding demands. The average selling price of dried and wet cacao beans was within ₱88.00 to ₱95.00 per kilogram and 30.00 to 32.00 per kilogram respectively; and 49.02% of the farmer-respondents sold their produce directly to wholesalers, such as Kennemer Foods International Inc., who served as consolidators of cacao products. It must be noted that the Agrarian Reform Beneficiaries Organizations (ARBOs) were under a loan grant with the Land bank of the Philippines payable in 5 years after the release of the grant. The grants were computed based on per hectare of land cultivated with cacao. Also, Piñan-PiMCO and Polanco-POEMCO cacao projects were likewise funded by the same lending institution but on different financing scheme since the loan was made by the Cooperative itself.

The amount in turn was being loaned to its members who will venture into cacao production under the Philippine Rural Development Project.

Farmers Perceptions on the Opportunities and Risk Relative to Cacao Farming Business in the Province of Zamboanga del Norte

Table 1 Opportunities and Risks of Cacao Farming Business as Perceived by the Respondents in the area of Profitability

Profitability	Weighted Mean	Interpretation
a. Highly suitable for intercropping and other mixed farming system for sufficient earnings for the next 10 years.	3.774	Certainly an opportunity
b. Huge local market demand and higher local & international market prices.	3.771	Certainly an opportunity
c. Best cacao seeds acquired to increase income.	3.699	Certainly an opportunity
d. Increased dollar earnings through exports.	3.6895	Certainly an opportunity
e. High income crop if productive capacity is attained.	3.6536	Certainly an opportunity
f. Offering of tax incentives by Philippine government	3.650	Certainly an opportunity
g. Expenses reduction made.	3.4150	Certainly an opportunity
h. Procurement of cheaper farm machineries	3.2843	Certainly an opportunity
i. Availability of marcotted seedlings	3.00	Probably an opportunity
j. High prices of fertilizers	1.8627	Probably a risk
Average Weighted Mean	3.37991	Certainly an opportunity

Table 1 show that respondents viewed most aspects of cacao farming as opportunities (weighted mean 3.2843 - 3.774), with the suitability for intercropping and long-term earnings (3.774) and future market demand (3.771) rated highest. Whereas, high fertilizer prices (1.8627) were seen as a risk. The availability of marcotted seedlings was considered a probable opportunity (3.00). Overall, farmers perceived cacao farming as profitable (weighted mean 3.37991), citing high market demand and intercropping potential. The present finding is supported in the study of Obiri, Bright, McDonald, Anglaaere, & Cobbina (2017) which state that cocoa production is profitable and there is a corresponding improvement in the rural livelihood as well as enhanced farm sustainability. Likewise, the present finding is corroborated by Matissek, et al. (2012) whose study revealed that sustainability standards are increasingly being applied in cocoa production, as demand for raw cocoa will continue to rise - training, improved production methods, rising productivity and promotion of diversification guarantee that cocoa of a consistently high quality and in quantities to meet market needs is offered by farmers, thus securing their long-term livelihoods.

Table 2 Opportunities and Risks of Cacao Farming Business as Perceived by the Respondents in the Area of Labor

Labor Resources	Weighted Mean	Interpretation
a. Family/cooperative members are actively involved in the practical work on the farm.	3.706	Certainly an opportunity
b. Farmers and hired labor should undergo proper trainings.	3.702	certainly an opportunity
c. Projects are being set up to try out better farming methods.	3.539	Certainly an opportunity
d. Farmers should learn how to take care of the hand pumps for watering and other machineries.	3.523	Certainly an opportunity
e. Farmers in the Zambo. Norte have little trouble finding affordable hired cacao farm labor	2.92	Probably an opportunity
f. Farmers in the Zambo. Norte have little trouble finding reliable hired farm labor to work in the cacao plantation.	2.320	Probably a risk
g. Hired farm labor has limited technical knowledge and skills to improve cocoa cultivation systems and practices.	1.895	Probably a risk
h. Dwindling interest of young farmers in engaging cocoa production.	2.180	Probably a risk
i. Families are large because these farmers need children to help them in the fields.	2.163	Probably a risk
Average Weighted Mean	2.883	Probably an opportunity

Regarding labor (Table 2), respondents' rated family/cooperative involvement highest (mean 3.706), highlighting the family-oriented nature of farming and reduced labor costs. Training for farmers and hired labor (3.702) and testing improved farming methods (3.539) also scored well. Conversely, limited skills of hired labor (1.895), declining youth interest (2.180), and reliance on large families for farm labor (2.163) were perceived as risk. The result is concomitant with the findings of Feder (2016) who posited that despite of the increased scale in farm management, in many advanced countries the family remains the main source of farm labor. Hired labor supervision costs tend to favor family farming as the equilibrium institution.

Table 3 Opportunities and Risks of Cacao Farming Business as Perceived by the Respondents in the Area of Production

Production	Weighted Mean	Interpretation
a. Government renders various support services to upgrade & expand cocoa farming system.	3.703	Certainly an opportunity
b. Good agro-climatic endowment	3.719	Certainly an opportunity
c. Availability of areas for expansion under mono-cropping or intercropping for production expansion	3.673	Certainly an opportunity
d. Limited access to sources of planting and grafting materials.	1.967	Probably a risk
e. Availability of high yielding clones in the country.	3.284	Probably an opportunity
f. Substitution of low quality cocoa butter with vegetable oils in some applications	1.886	Probably a risk
g. Non-perishable after processing	3.585	Certainly an opportunity
h. Limited access to technology and post harvesting facilities.	1.892	Probably a risk
i. Prevalence of pests and diseases.	1.588	Probably a risk
Average Weighted Mean	2.81	Probably an opportunity

Regarding cacao production (table 3), respondents identified favorable climate (3.719), government support (3.703), land availability for expansion (3.673), and the non-perishable nature of processed beans (3.585), as significant opportunities. High-yielding clones were also seen as probable opportunity (3.284). On the contrary, limited access to planting materials (1.967), technology/post-harvest facilities (1.892), cocoa butter substitution (1.886), and pest/disease prevalence (1.588) were considered risks. Overall, cacao production was viewed as probable opportunity (mean 2.81). Lima, Almeida, ob Nout, & Zwietering (2011) posited that the quality of commercial cocoa beans primarily relies on the combination of factors that include the type of planting material, the agricultural practices, and the post-harvest processing such as the fermentation of the cocoa beans which is still considered the most relevant aspect since the process is considered as the precursors which the cocoa flavor arise.

Table 4 ***Opportunities and Risks of Cacao Farming Business as Perceived by the Respondents in the Area of Capitalization***

Capitalization/Investment	Weighted Mean	Interpretation
a. Expected returns of cacao farming can be attained	3.784	certainly an opportunity
b. Government provides efficient support to cacao farmers.	3.549	certainly an opportunity
c. Farmers/cooperative has sufficient funds from Government	3.556	certainly an opportunity
d. Limited credit facilities.	2.199	probably a risk
e. High prices of fertilizers.	1.598	probably a risk
f. Under-investment and gaps in financing growth and scale	1.450	certainly a risk
g. Lending institutions not accustomed to seasonal cash flows.	1.225	certainly a risk
h. Transportation facilities must be provided.	3.611	certainly an opportunity
i. Disbursed borrowers lack financial management skills and knowledge.	1.360	certainly a risk
Average Weighted Mean	2.23	Probably a risk

Concerning investment (table 4), respondents viewed potential returns through proper planning and investment (3.784), transportation access (3.611), and government funding (3.556) as significant opportunities. Conversely, lenders' unfamiliarity with seasonal farming cash flows (1.225), farmers' limited financial management skills (1.360), and underinvestment leading to value chain inefficiencies (1.450) were seen as major risk. Extending credit to farmers' boosts farm growth and household incomes, as farm income primarily supports families (Dabone, Osei, & Petershie, 2014). Also, sustainable cocoa production significantly impacts farmers' lives, particularly smallholder farmers with limited resources (Houston & Wyer, 2012), besides public-private partnerships are improving sustainable cocoa farming and farmer livelihoods. However, Asamoah & Amoah (2015) asserted that rural farmers struggle to access credit due to low incomes and limited savings. Thus, microfinance schemes, with their peer support and group guarantees, offer a solution by mobilizing savings and fostering a repayment solution.

Table 5 Opportunities and Risks of Cacao Farming Business as Perceived by the Respondents in the Area of Management

Farm Management	Weighted Mean	Interpretation
a. Poor market access and fragmented linkages	1.604	Probably a risk
b. Secured coordination among market, farmers, and other support services.	3.438	Probably an opportunity
c. Internationally recognized cocoa bean quality standards	2.026	Probably a risk
d. Limited business or marketing skills.	1.716	Probably a risk
e. Inadequate Research &Development and extension services.	1.712	Probably a risk
f. Limited measures to counteract climate or disaster risks.	1.559	Probably a risk
g. Knowledge on for technician/supervisor on management functions – planning, organizing, leading and controlling.	3.709	certainly an opportunity
h. Provision of water reservoir in case of drought.	3.484	probably an opportunity
i. Cacao farm to be free from any farm animals.	3.202	probably an opportunity
Average weighted mean	2.494	probably a risk

In table 5, respondents identified several opportunities in cacao farming management, such as skilled technicians (3.709), water reservoirs (3.484), coordinated market access (3.438), and pest control (3.202). Conversely, perceived risks, included limited disaster mitigation (1.559), poor market access (1.604), insufficient business skills (1.716), inadequate R&D/extension (1.712), and unforced quality standards (2.026). Overall, farm management was perceived as a probable risk (weighted mean 2.494). Baloyi (2010) claimed that smallholder farmers faced marketing challenges due to limited access to production resources (land, water, infrastructure, labor, capital and management) and agricultural support services. These therefore restricts their participation in high value-market markets, with most sales occurring locally, or at the farm gate. Also, lack of access to markets and market information further disadvantages the farmers, leading to reliance on subsistence farming and reduced bargaining power (Magesa, Michael, & Ko, 2014). Thus, improved access to resources and market information is crucial for smallholder cacao farmers to thrive.

Table 6 Test of Difference Between the Opportunities and Risks of The Cacao Farming Business as Perceived by The Respondents

Descriptors	Paired Differences					T	df	Sig. (2-tailed)	Interpretation	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference						
				Lower	Upper					
Profitability	2.13200E2	129.16037	40.84409	120.80424	305.59576	5.220	9	.001	Has difference	significant
Labor Resources	9.30000E1	179.48746	59.82915	-44.96628	230.96628	1.554	8	.159	No difference	significant
Production	7.18889E1	221.73771	73.91257	-98.55380	242.33158	.973	8	.359	No difference	significant
Investment	-5.22222	267.08415	89.02805	-210.52128	200.07683	-.059	8	.955	No difference	significant
Farm Management	-2.11111	227.83352	75.94451	-177.23945	173.01723	-.028	8	.979	No difference	significant

As reflected in Table 6, the t-statistics is lower than the specified alpha level of .05, thus, there is a statistically significant difference between opportunities and risks associated with cacao farming business in terms of profitability. On the contrary, all the four variables' computed two-tailed p-values are greater than the specified alpha level of .05, thus, there is no statistically significant difference between opportunities and risks associated with cacao farming business in terms of labor resources, production, investment and farm management as perceived by the respondents.

IV. Conclusion

Engagement in agri-business encompasses opportunities and risks associated with investment, labor, production, profitability and farm management. Based on the findings of the study, opportunities for cacao farming business in Zamboanga del Norte outweigh its risks.

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