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CHALLENGES AND OPPORTUNITIES OF VEGETABLE PRODUCTION IN ISABELA CITY, BASILAN PROVINCE, PHILIPPINES

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ABSTRACT

A vital center of commerce and industry, City of Isabela, Basilan Province, Philippines also faces food insecurity issues as a result of urbanization, land use change and low food output, while demand for vegetables is steadily rising. Meeting this demand, imports of assorted vegetables increased to more than 95% coming from various sources in Mindanao passing through the ports of Zamboanga City, Philippines. These are challenges in vegetable production, while it plays a crucial role in its local economy being an alternative source of earning livelihood, an important income generation and employment opportunities to majority in the rural areas. This paper presents various constraints including the experiences and lessons learned from smallholder farmers on the status of vegetable production. Utilizing data from previous survey records, various case studies, annual reports, project documents and recorded narratives including the identification of vegetable growers, production sites and market distribution channels. Findings highlight major constraints

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such as limited access to agricultural inputs, market linkages and transportation infrastructures. Despite these constraints, the vegetable sector is assured of opportunities for growth through government initiatives in logistics, farm inputs and technical support. Keeping local farmers to get their expected returns, this study emphasized the need for government intervention to bolster market linkages, incentivize local production and support smallholder farmers to overcome existing constraints and make the City of Isabela a key contributor to sustainable vegetable production. Future policy measures and government intervention will help ensure stable market price, production approaches and quality standards. Further development may be strengthened through enhanced capacity building, forge partnerships with institutional buyers and the creation of an enabling environment to generate insights and dynamic market information toward a sustainable development of smallholder production systems in the City of Isabela, Basilan Province, Philippines.

Keywords: farming system, fruit and leafy vegetables, issues and constraints, City of Isabela, Basilan Province

1. INTRODUCTION

City of Isabela, a component city of Basilan Province, Philippines is situated in the northern part of the province surrounded by the waters of the Celebes Sea, Moro Gulf and Sulu Sea [1], hence named as the melting pot being the center of commerce and industry. Agriculture plays a key role in the city's local economy. Coconut, rubber and understorey production (cash crops) dominate the production landscapes in rural and upland areas [2, 1, 3-5] and is a potential industry for trade development, income generation and livelihood opportunities to 1,178 farmers [6], while the production of corn, vegetables, fruits and other commercial crops are grown for food to meet the demand of the current 147,313 population [3, 7-8] and this is projected to increase to 176,927 in 2030 (16.7% increase) at 3.1% annual growth rate (AGR), one of the highest AGR in the country [3, 7-8].

The current production practices are classified as smallholder production systems having a land size of less than 0.5 hectare per individual. But this type of system dominates the vegetable production in the nine (9) barangays with 21 various vegetable farm locations totalling to 23.0 hectares or an equivalent annual production of 56.48 mt compared to the demand of 25,831.3 mt year^{-1} [9, 4-5, 10, 11-12]. The deficit of 25,774.82 mt year^{-1} opens wide opportunity to markets which encouraged importation of about 95.23% of vegetables needed in the City of Isabela are outsourced [2] causing prices to rise exorbitantly. Majority of the vegetable crops sold and found in the city's wet and dry markets are imported from various sources in Mindanao passing through the ports of Zamboanga City, Philippines [4-5], of which, eleven of these vegetables shipped in

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can be grown locally [13] and are potential livelihood opportunities to help provide rural households viable earnings with assured year-round production [11-12] coupled with sound local initiatives, provision of farm inputs and technical support.

Of the total land area (22,507.68 hectares), 9,028.9 (40.11%) and 11,143.3 (49.51%) hectares are classified as agriculture and forest lands, while the remaining 10.38% (2,336.3 hectares) is used for built-ups and other uses, respectively [2, 1, 3] but agricultural lands is projected to decrease by 0.8% or this is equivalent to 72.23 hectares due to reclassification and land conversion into other uses such as the establishment of growth centers, institutional facilities and built-ups [5-6]. However, the agriculture sector remains significant contributor in the city's local economy and evidently farming is the main source of livelihood [2, 1], yet the city is identified with the lowest per capita consumptions (ppc) of fresh vegetables amounting only at 58.4 kg ppc in 2018 [9], which was significantly lower than the recommended rate of 146.0 kg ppc [10-11, 12, 9]. Low output and high demand scenario brought the city vulnerable to food insecurity and malnutrition, and one form is the undernutrition [10, 11-12, 9].

Undernutrition such as wasting, stunting and underweight; insufficient vitamins and minerals, overweight or obesity, and diet-related non-communicable diseases are all examples of malnutrition. Based on the 2018 Expanded National Nutrition Survey (ENNS), only 38% of the households in the City of Isabela is food secured, while 62% suffered a high level of food insecurity such as *mild food insecurity (12.2%), moderate food insecurity (31.7%), and severe food insecurity (18.1%),* respectively [9] as a result to low intake of vegetables due to significantly low supply of locally grown assorted vegetables in the city. The multi-faceted constraints on vegetable farming and consumption should paved a way to the creation of an enabling environment for vegetable farming that responds to the knowledge intensive nature of vegetable production, ensuring an effective flow of both long-term technical information and marketing strategies [14].

The Philippine Development Plan 2017-2022 (PDP, 2017-2022) offers a major opportunity to enhance the performance of the vegetable supply chain and to improve the livelihood of smallholder farmers. As this plays a crucial role for nutrition and health, vegetable farming also fosters economic development by raising incomes of smallholder farmers, increasing employment and opening viable opportunities. This study was aimed to highlight various constraints and status of vegetable production in the City of Isabela, Basilan Province, Philippines. Specifically, this was aimed to determine the most widely produced vegetables, area of production, and market distribution channels including key approaches and opportunities for the development of action plans for policy intervention to improve production and foster opportunities.

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2. MATERIALS AND METHODS

2.1 Study Sites

The study was conducted in the nine (9) vegetable producing barangays, namely: *Tabiawan, Baluno, Begang, Panunsulan, Lanote, Calvario, Cabunbata, Kumalarang and Lumbang* all located in the City of Isabela having a total of 21 vegetable farm locations within the nine barangays with 129 small-scale farm owners and members of farmer associations, and an area totalling to 23.0 hectares with a potential production of 55-60 mt of assorted vegetables year^{-1} (OCA, 2021; 2023).

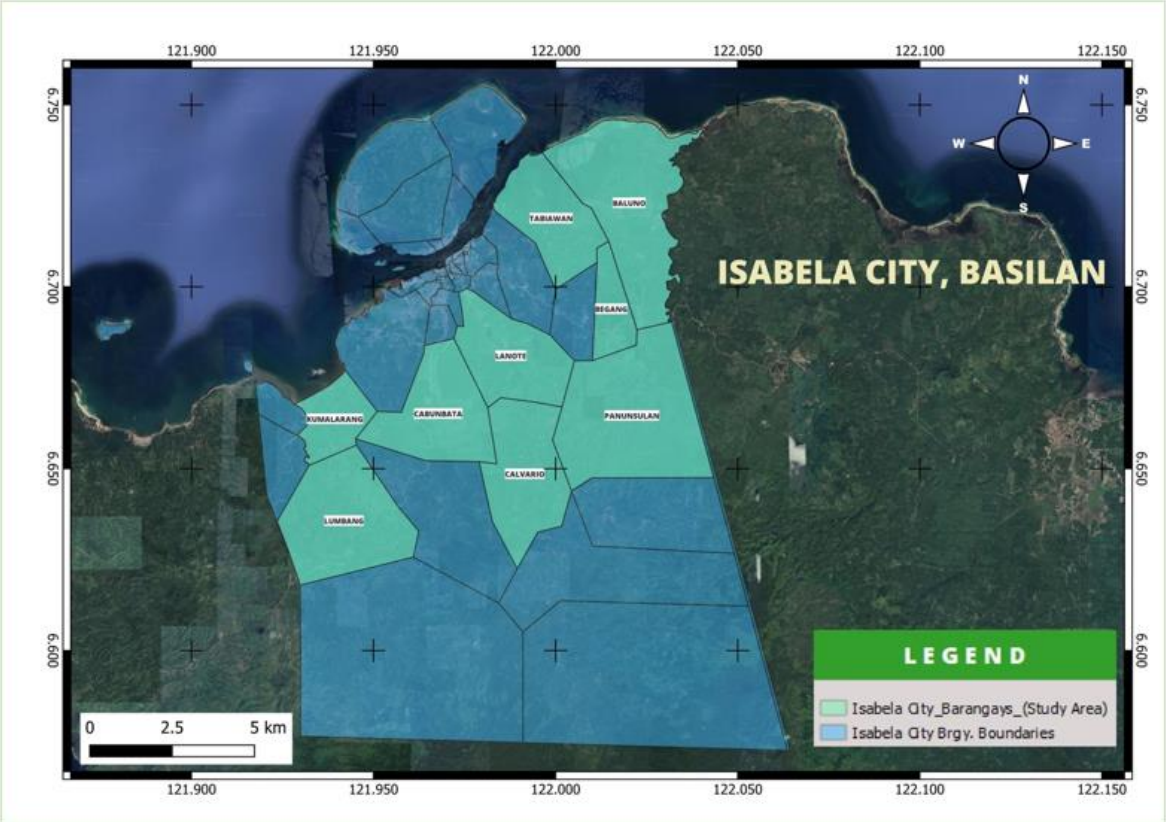

Figure 1: Map of study sites.

2.2 Respondents

The respondents were predetermined and selected based on the official list of vegetable growers with corresponding area of production collected from the Office of the City Agriculturist (OCA), City of Isabela, Basilan Province, Philippines. Conduct of field visits, participatory rural appraisal

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(PRA) and key informant interview (KII) were utilized to determine the major constraints and status of vegetable production in the city. Important information such as validation and assessment of the existence of identified vegetable growers, farm associations, area of production, harvest and postharvest, market, channel of distributions, traders, assemblers, institutional buyers, support and intervention initiatives including viable opportunities were also gathered and considered valuable information for the creation of future policy measures, plans and programs that will benefit farming communities.

2.3 Data Collection and Analysis.

Combined data from previous farm surveys, case studies, project documents, annual reports and narratives collected from the OCA and the City Planning and Development Office (CPDO) of the City of Isabela, Basilan Province, Philippines were utilized. Other sources from the Department of Agriculture (DA), Philippine Statistics Authority (PSA), Department of Science and Technology (DOST), Food and Agriculture Organization (FAO), World Health Organization (WHO) and the World Bank were also used. The data were processed and analysed using descriptive statistics where the total, average and percent were used to discuss the variables.

3. RESULTS AND DISCUSSION

3.1. Results

In the vicinity of rural and upland areas of the City of Isabela, where agriculture is the major source of livelihood and cash income, vegetable farming appears to be as one of the potential enterprises for income generation [2-3, 6], although the area of production and farm sites are small but in increasing trend than it was three (3) years ago [5-6]. Table 1 shows the nine (9) barangays covered based on various recorded reports totalling to 23.0 hectares as an aggregate production area derived from the 21 various vegetable farm locations covered. This increasing trend is an indicative that vegetable farming remains an important sector in agriculture and a viable source of income for smallholder farmers practicing agriculture in a small plot of land [5-6, 1, 3]. Of the nine barangays, Baluno covered five (5) farm sites with 9.3 hectares in total, while Tabiawan with one (1) farm site at 0.3-hectare area covered or an average of 1.1-hectare production site farm^{-1} across the nine barangays (Table 1), reflecting effective local extension programs of the city government.

Table 2 shows the total production area in hectares with the corresponding fruit, legume and leafy vegetables produced in the city. There were 14 types of vegetables that are commonly produced locally. Of this total, 11 fruit vegetables were popularly grown, while three identified as leafy vegetables. Of the 11 fruit vegetables, string beans (*Phaseolus vulgaris*) shared the biggest area planted at 3.7 hectares being the most popular crop in the province, while eggplant (*Solanum melongena*), squash (*Cucurbita maxima*), bitter gourd (*Momordica charantia*), bottle gourd

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(*Lagenaria siceraria*) and cucumber (*Cucumis sativus*) with respective area planted of 3.4, 2.9, 2.8, 2.7 and 1.5 hectares, while of the three (3) leaf type vegetables, pechay (*Brassica rapa*) is considered an important crop planted at 1.0 hectare (Table 2).

Table 1: Total number of farms and production area covered.

Location[1] (Barangay)	Number of Farms[1]	Area[1] (ha)	%
Baluno	5	9.3	40.4
Lumbang	4	5.1	22.1
Panunsulan	1	2.8	12.2
Calvario	3	1.3	5.8
Kumalarang	2	1.3	5.5
Lanote	2	1.2	5.2
Begang	2	0.9	3.9
Cabunbata	1	0.9	3.7
Tabiawan	1	0.3	1.2
Total	**21**	**23.0**	**100**

[1/]combined sources from the Office of the City Agriculturist (OCA) and the City Planning and Development Office (CPDO), City of Isabela, Basilan Province, Philippines.

Table 2: Common fruit, legume and leafy vegetables produced in Isabela City, Basilan

Fruits and legume vegetables[2]	Area (ha)	Leafy Vegetables[2]	Area (ha)
String beans	3.7	Pechay	1.0
Eggplant	3.4	Mustard	0.7
Squash	2.9	Upland Kangkong	0.5
Bitter Gourd	2.8		
Bottle Gourd	2.7		
Cucumber	1.5		
Lady's Finger	1.0		
Radish	0.9		
Mungbean	0.8		
Tomato	0.8		
Bell Pepper	0.4		
Total	**20.9**		**2.1**

[2/]common fruits, legumes and leafy vegetables grown in Isabela City, Basilan Province based on the data collected from the OCA and CPDO, 2021 and 2023.

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Identification of constraints is very crucial for the growth and development of the vegetable farming in the City of Isabela. Constraints indicate the hindering issues related to the vegetable farming and suggest the need for designing, re-designing, and implementation of appropriate interventions that address the constraints appropriately [15]. Table 3 shows the list of responses by the 129 small-scale farm owners and farmer association members to major identified constraints (Table 3). Results showed that majority of the smallholder vegetable farmers experienced access to agricultural inputs (16.3%), market linkages (16.3%), prices of agricultural inputs (16.3%) and selling/retail price of vegetable produce (16.3%) as the major constraints compared to access to market information (10.9%), access to transportation (10.1%), access to technology (8.5%), access to government intervention (3.9%) and access to road (1.6%), respectively. While, Tables 1 and 2 indicated that vegetable farming have continuously attracted small-scale farmers in the City of Isabela, however the existing constraints listed in Table 3 has deprived farmers from their expected returns especially on income and overcoming these constraints remain a crucial challenge although local initiatives are in place [3, 5-6].

These vegetables are common and priced commodities grown in a small production systems as intercropped, mixed cropping, and multi-cropping systems. These are important features hoping to expand to more areas benefiting from an emerging and growing vegetable farming and opportunities in other parts of the supply chain including postharvest, processing, product development and marketing. Capacitation of farming communities will help pave the way for the integration of subsistence farmers (ARB beneficiaries), the landless (tenants) and other resource-poor people who are excluded from markets into broader economic activities, and thus play a significant role in sustaining rural communities. Other sectors in the supply chain are the integration of women and out-of-school youth into a vibrant vegetable farming, as they move from being dependent day-labour and become self-employed entrepreneurs.

Greater involvement of farming communities will create an empowered society in an enabling environment with greater vision to alleviate poverty and malnutrition. In addition, poor households in urban areas benefit through improved access to fruit and vegetables and an increase in employment opportunities, hence helping achieve a healthy and profit-oriented community, improvement of human health and wellbeing as well as the generation of employment and income and will directly benefit particularly smallholder farmers and poor households in the City of Isabela, Basilan Province.

Table 3 shows the list of responses of 129 small-scale farm owners and farmer association members to major identified challenges.

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Table 3: Number of Challenges Identified and Responses

Challenges[3]	Response[3]	% n=21
Access to agricultural inputs	21	100
Market linkages	21	100
Prices of agricultural inputs	21	100
Selling/retail price of produce	21	100
Access to market information	14	66.67
Access to transportation	13	61.90
Access to technology	11	52.38
Access to government intervention	5	23.81
Access to road	2	9.52

[3/]combined sources from the Office of the City Agriculturist (OCA) and the City Planning and Development Office (CPDO), City of Isabela, Basilan Province, Philippines.

3.2 Discussions

There were nine (9) barangays identified as location sites with a total of 129 farm cooperators, small-scale farms and members of farmer associations covering a total of 23.0 hectares, where each farmer is characterised to have at least five (5) years of vegetable farming experience. Of the nine barangays, *Baluno, Lumbang and Panunsulan* were identified having the larger areas utilized for vegetable production (9.3 hectares) or this is 40.4% of the total area, 5.1 (22.1%) and 2.8 (12.2%) hectares in aggregate, respectively. The case of Barangay Baluno, it is an Agrarian Reform Beneficiary (ARB) accorded by the Department of Agrarian Reform (DAR), a national agency mandated to implement the Comprehensive Agrarian Reform Program (CARP). Being an ARB, benefits include the free use of their lands coupled with the intervention support from both the local and national government. Production support and services come in various forms from the Department of Agriculture (DA), Agricultural Training Institute (ATI), Philippine Coconut Authority (PCA) and from other government line agencies and private sectors. The case of Barangay Baluno, the institutional buyers include the Bureau of Jail Management and Penology (BJMP), local stalls in the wet market, a number of eateries and restaurants.

On the other hand, Barangay Lumbang with proximity close to existing institutional buyers and contract traders where most of their produce are transported to the Municipality of Maluso, while produce from Barangay Panunsulan goes to local farmers center or the "*bagsakan center*", where fresh produce is displayed and sold for a reasonable price, hence attracting local consumers and

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buyers. The presence of small and large consumers positioned these three barangays to better production, market and promotional benefits.

Like the barangays Baluno, Lumbang and Panunsulan, production areas of barangays *Calvario, Kumalarang, Lanote, Begang, Cabunbata and Tabiawan* (Table 1) are farm sites with access to irrigation water, government intervention and technical support producing a variety of fruit and legume vegetables such as *eggplant, squash, bitter gourd, bottle gourd, cucumber, lady's finger, radish, tomato, bell pepper, mungbean and string beans; while leafy vegetables include pechay, upland kangkong and mustard* in small scale (Table 2) with a total production area of 23.0 hectares (Table 1) or this is less than 1.0% of the city's total land area, generated an average harvest totalling to 56.48 mt [6], but this harvest is 95.23% insufficient reflective of the current status of vegetable production in the city, the reason there was increase in importation of vegetables coming from various sources.

The common vegetables listed in Table 2 remain as priced commodities grown in small production systems either as intercropped, mixed cropping and multi-cropping systems in various locations in the lowland and upland environments [13, 5-6]. These are important features with a goal to expand to more production areas benefiting from an emerging and growing vegetable farming and opportunities in other parts of the supply chain including postharvest, processing, product development and marketing. Accounting as well the pre-land preparation (PLP), crop establishment (CE), crop care and maintenance (CCM), harvest and postharvest (HPH) to determine the energy inputs and capital requirements, an important procedure to account the high and lows of the production systems [16-18].

Capacitation of farming communities will help pave the way for the integration of subsistence farmers who are landowners (e.g., ARB beneficiaries), the landless (tenants) and other resource-poor people (farm laborers) who were once excluded from markets into broader economic activities. This approach is pivotal and will play a significant role in sustaining rural development especially in the promotion of sustainable farming systems in rural and farming communities benefitting a total of 1,178 farmers, mostly are smallholder types [6]. Other sectors in the supply chain are the integration of women under the rural improvement club (RIC) program, and out-of-school youth under the farm youth development program (FYDP) into a vibrant vegetable farming enterprise, as they move from being dependent on day-labour and become capacitated and self-employed entrepreneurs.

Greater involvement of farming communities will create an empowered society in an enabling environment with greater vision to alleviate poverty and malnutrition. In addition, poor households in urban areas benefit through improved access to fruit and vegetables and an increase in

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employment opportunities, hence helping achieve a healthy and profit-oriented community, improvement of human health with the use of organic inputs such enriched fish amino acid and other liquid fertilizers for their production [19] and wellbeing as well as the generation of employment and income [14, 20, 18], while promoting environmental health and protection [21] and will directly benefit particularly smallholder farmers and poor households in the City of Isabela and the entire province of Basilan [6].

Of the total responses, majority believed that access to agricultural inputs, market linkages, prices of agricultural inputs and selling/retail price of produce are the most challenging issues, while the least challenge was access to road (Table 2). It was evident that the vegetable growers were more concerned about the access to transportation (10.1%) as it played a vital role in the movement of perishable goods from one place at a right time and at a right place. It was noted that while vegetable farmers revealed how to sell their produce, a substantial number of vegetable growers were able to establish a good market linkage by having a contract buying agreement (localized system) and utilizing online platforms – *an approach appeared to be effective specially during the pandemic times.* Some of the farmers/producers owned their own vegetable stalls within or near the production areas or a proximity close to their residences, or commonly known as a *sari-sari* store (local variety store), while few of the beneficiaries utilized government facilities or call this the *bagsakan* center and a number resolved at commuting to deliver their goods, while very few (3 beneficiaries) owned their vehicles utilized to transport goods from their farm to various market outlets within and outside the City of Isabela serving other local consumers within the province.

3.3 What's the gap?

The local agriculture office revealed that 95.23% of the vegetables sold in both the wet and dry public markets were imported from various sources through the ports of Zamboanga City. These vegetable goods are eggplant *(Solanum melongena L.)*, pechay *(Brassica rapa subsp. Chinensis)*, tomato *(Solanum lycopersicum)*, bell pepper *(Capsicum annuum)*, string beans *(Vigna unguiculata ssp. Sesquipedalis)*, cabbage *(Brassica oleraceae)*, mustard *(Brassica nigra)*, bottle gourd *(Lagenaria siceraria)*, cucumber *(Cucumis sativus)*, bitter gourd *(Momordica charantia)*, chinese pechay *(Brassica rapa, var. pekinensis)*, radish *(Raphanus sativus)*, baguio beans *(Phaseolus vulgaris)*, carrots *(Daucus carota)*, chayote *(Sechium edule)*, potato *(Solanum tuberosum)*, sponge gourd *(Luffa aegyptiaca)*, squash *(Cucurbita maxima)*, sweet potato *(Ipomoea batatas)*, malabar spinach *(Basella alba)*, ginger *(Zingiber officinale)*, onions *(Allium cepa)*, shallot *(Allium ascalonicum L)*, garlic *(Allium sativum)*, and spring onion *(Allium fistulosum)*, including calamansi (Citrus × macrocarpa) [13].

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Vegetable farmers allotted small patches of land in cultivating vegetables. The feature of being a small-scale farming enterprise is sadly discouraging despite its benefits and potential to markets and income. For example, vegetable farmers grow bell pepper in four different production sites, yet it only accumulated to 0.43 hectare of production area in total, having an average of 0.10 hectare, this describes the smallholder farm in various areas.

The highest vegetable cultivated in the city has an aggregate area of 17 different production sites accumulating 3.71 hectares in total but remain insufficient to meet the total demand of the city. The low output production systems are results from the lack of local stores that sell agricultural inputs, particularly seeds, fertilizers and pesticides. This remains a prevailing issue that farmers associate with the agricultural input's cost and expense, hence making farm inputs difficult to access. Transportation is also a key factor identified by most of the vegetable growers since there is no other option but to lease a tricycle (a local transport system) since there is no other available public transportation in the city to move their vegetable produce to various outlets.

Less than half or 38% of the city indicated they were food secured, which implies that more than half of the households (62%) experienced food insecurity [9]. This may further imply that 62% of the household in the City of Isabela consumed vegetables at 58.4 kg per capita consumption (ppc) but this below the recommended per capita of 400.0 g day^{-1} or this is 146.0 kg ppc [22, 12].

3.4 Opportunity: *The Ways Forward*

Despite these constraints, vegetable sector has a lot to prove and has not yet exploited its potential to the fullest. The city needs more farmers investing in vegetable production. It is clear that at least 5% of the produced vegetable in the wet and dry markets are grown and harvested locally, this only implies two things, 1) vegetable growers sold their produce directly to the end user such as processing entities like local restaurants, neighbouring municipality, owned a stall, and supplying at least a middlemen or vegetable vendor in the market; and, 2) the limited number of producers and production area made it impossible to cope up with the demand, which have resulted to importation of vegetable commodity form the neighbouring island.

Vegetable production system provides opportunities that vegetable farmers need to improve. Strategic planning, incorporating crop rotations in a small patch of land, while considering short cropping periods to cope up with the demand is a complex yet rewarding decision. Investing in logistic industry is another way of promoting and encouraging vegetable growers to produce more. 47% or ten (10) out of 21 vegetable growers opted to commute or contracted third party delivery service to ensure produce's timing of disposal to the market and or consumer.

Consequently, the City of Isabela needs more agricultural capitalist, particularly in retailing agricultural inputs such as seeds, fertilizers, pesticides and or insecticide, and other agricultural farm tools and materials including machines that are essential in the production and marketing of

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the produce. Respondents have revealed that most of their agricultural inputs are purchased in Zamboanga City, while the local government provides intervention such as seeds and other agricultural inputs and materials, loaning opportunity and agricultural machinery rentals, these are short terms and they have acknowledged its limitations. These basic interventions and investments will do great in the long run, providing local farmers reliable and accessible retail conduits for their production.

The ultimate challenge rest to the City Government, to view these issues and constraints as opportunities. These can be possibly done by allocating considerable resources in generating market linkages and information. Other provisions may include by putting up policies and other mechanisms, particularly in the patronage of locally produced commodity by the public market vendors. These locally produced vegetables may serve as preferential produce to be sold in their stalls, and safeguarding the rights and needs of the vegetable growers. Providing incentives and intensifying and promoting vegetable production, particularly the various vegetable production system and technology, thereby maximizing the vegetable produce's distribution. Key outlooks include improving farmers profits, facilitating industry restructuring, enhancing industry partners, focusing market development and increasing production and consumption in the local environments.

4. CONCLUSION

Agriculture has been the main source of livelihood specially in the rural areas of the city, where vegetable plays a significant role in domestic consumption and income generation. Vegetable growers in the city are too small to fulfil the demands of its citizens. Despite the suitability of the local climate, soil fertility, and topography vegetable production remains insufficient to meet the city's demand, forcing the reliance to imported vegetables. The study reveals significant challenges, including limited access to retail outlets for agricultural inputs, fluctuating market prices, and inadequate transportation infrastructure.

To support the city's vegetable farming sector, an actionable step should be taken. Local government and private sector interventions focused on improving farmers' access to agricultural inputs through locally available retail establishments. Moreover, enhancing the transportation and providing logistical support, particularly those farmers far from the city center, this can be achieved through consolidation of farm produce. To further alleviate transportation costs, it is crucial farmers are organized and have established systems in place. This will facilitate the establishment of drop-off points where members and neighbouring farmers, conveniently deliver their produce near their farming areas. Promotion of synchronized farming schedules and encouraging commodity specialization per farmer will also help address the supply deficiency, reduce the need for importation, and foster market linkages, prioritizing locally grown produce.

Such interventions and initiatives require institutionalization through policy measures. One of is the creation of a policy that promotes the patronage of locally produced vegetables in public markets, alongside incentives for vegetable growers and retailers, stimulating production and profitability. The development of planting calendar will help regulate and prevents under- and

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over-supply of vegetable commodities, facilitating a smooth transition towards lowering importation rates and strengthen local production capacity. Furthermore, the development of production plans for idle agricultural lands and understorey cultivation can increase production, provide added income to perennial-based farmers, and integrate efficient crop maintenance through indirect fertilization and clearing of the grass and the main crops.

Stakeholders should leverage the use of science-based data and information in crafting farm development plans, particularly exploring the impacts of different vegetable production systems, like crop rotation, and intercropping strategies, the role of women and youth in vegetable value chain segments should be emphasized. Strengthen the monitoring and evaluation mechanism of not only local government as well as private sector, to determine the long-term effects of such interventions extended and received, particularly in terms of market development, income generation, and food security. These information and data are essential in sustaining the growth of the city's vegetable farming sector.

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