




Equitable Food and Nutrition Security Initiatives for Farmers and Fisher folks in Masbate, Philippines

CLORES, Novy R.

 0000-0003-0830-0190; Dr. Emilio B. Espinosa, Sr. Memorial State College of Agriculture and Technology. Mandaon, Masbate, Philippines. nrclores@debesmscat.edu.ph; novadovs@gmail.com

The content expressed in this article is the sole responsibility of its author.

ABSTRACT

Loss of income among Filipino farmers and fisher folks caused by the pandemic resulted in food and nutrition insecurity in their respective households. This study highlighted the situation of farmers and fisher folks in a remote and economically depressed province in the Philippines. It proposed policies, action points, and a planning framework that would lessen, if not eliminate, food and nutrition insecurity among the farmers and fisher folks. A survey questionnaire, interview, non-participant observation, and FGD were used to gather data from the respondents. Results have shown that the majority of the respondents are their working age of 19 – 65 years old, the majority are males, and the majority are in the elementary level of education. The low level of schooling restricted their opportunity of finding alternative livelihoods thus also limiting their income. Thematic analysis of the FGD narratives revealed five emerging themes, namely: (1) Food shortage, (2) difficulty in accessing food, (3) involuntary hunger, (4) voluntary hunger (5) disorganized relief goods assistance from authorities. While the pandemic's negative effect on their source of livelihood is severe, they were able to institute drastic coping mechanisms for survival. The respondents still had a positive outlook and showed their usual resiliency to disasters. Analysis of the results became the basis for developing policies, action points, and the Smart *Sirungan* Planning Framework for a Food and Nutrition Secure Future for possible utilization. Future researchers may do further studies to enhance or challenge the proposed policies, action points, and the planning framework.

RESUMO

A perda de renda entre os agricultores e pescadores filipinos causada pela pandemia resultou em insegurança alimentar e nutricional em suas respectivas famílias. Este estudo destacou a situação dos agricultores e pescadores em uma província remota e economicamente deprimida nas Filipinas. Ele propôs políticas, pontos de ação e um quadro de planejamento que reduziriam, se não eliminassem, a insegurança alimentar e nutricional entre os agricultores e pescadores. Um questionário de pesquisa, entrevistas, observação não-participante e grupos focais foram utilizados para coletar dados dos entrevistados. Os resultados mostraram que a maioria dos entrevistados está na faixa etária ativa de 19 a 65 anos, a maioria é do sexo masculino e a maioria possui nível educacional até o ensino fundamental. O baixo nível de escolaridade restringiu suas oportunidades de encontrar meios de subsistência alternativos, limitando assim sua renda. A análise temática das narrativas dos grupos focais revelou cinco temas emergentes, a saber: (1) escassez de alimentos, (2) dificuldade de acesso aos alimentos, (3) fome involuntária, (4) fome voluntária e (5) assistência desorganizada de bens de socorro por parte das autoridades. Embora o efeito negativo da pandemia sobre sua fonte de sustento tenha sido severo, eles conseguiram instituir mecanismos drásticos de enfrentamento para sobrevivência. Os entrevistados ainda mantinham uma visão positiva e demonstraram sua habitual resiliência a desastres. A análise dos resultados serviu como base para o desenvolvimento de políticas, pontos de ação e o Quadro de Planejamento Smart *Sirungan* para um Futuro Seguro em Alimentos e Nutrição, para possível utilização. Pesquisas futuras podem realizar estudos adicionais para aprimorar ou desafiar as políticas propostas, os pontos de ação e o quadro de planejamento.

ARTICLE INFORMATION

Article process:
Submitted: 07/07/2024
Approved: 10/14/2024
Published: 10/17/2024



Keywords:

Food and Nutrition Security, Resiliency, Life lessons, Framework, Post Pandemic Outlook

Keywords:

Segurança Alimentar e Nutricional, Resiliência, Lições de Vida, Estrutura, Perspectiva Pós-Pandemia

Introduction

The pandemic may have passed but for the Philippines much still needs to be learned and proactively instituted by households (Hoffmann & Muttarak, 2017) and authorities in preparation for future disasters particularly in remote island communities (Abenir et al., 2022). Aside from major reports on the prevailing health situation coming from major urban areas, this study contends that a retrospective analysis of the experience especially from geographically isolated communities that were not highlighted in the news is needed so that an inclusive and holistic proactive action plan and framework could be developed.

In developing countries, agriculture and fishery sector are the major employer and source of food (Bhavani et al., 2020). While having a single source income is a typical Filipino farming and fishing family attribute one positive attribute is the appreciation of the significant role of able family members in processing and selling the produce or catch. It found out in a study that 25% of the women in the Philippines are involved in fish processing that adds income for their family. Having alternative income sources could strengthen their resiliency towards disasters. The same may apply to the province of Masbate, Philippines.

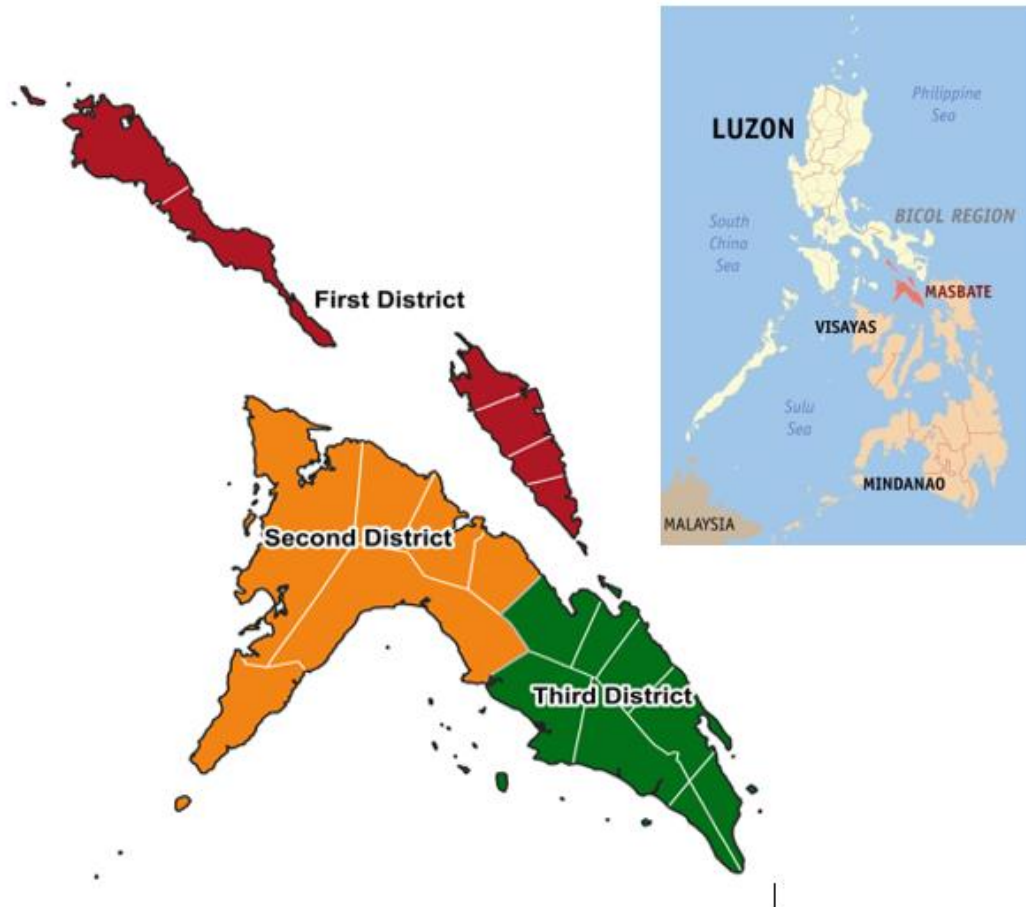
The province of Masbate is composed to three major islands – the Mainland *Masbate*, *Burias* and *Ticao* (Figure 1). Aside from mining, the province's economy is heavily reliant on its under developed agriculture and fishery placing it as among the beneficiaries of the present Philippine administration's Department of Agriculture - Special Area for Agricultural Development (SAAD) Program. The major permanent crop is coconut and the major non – permanent crop is rice (Philippine Statistics Authority 2022). The wide rolling lands are largely allotted to ranching of cattle, *carabao* (Philippine water buffalo), and horses. These ranches however are owned by a few affluent and influential individuals thus farmer's share is dictated by the owners thereby affecting their livelihood conditions (Koirala et al., 2016). In terms of farm products consumption, most are consumed locally while select heads of cattle, *carabaos* and horses are largely sold to neighboring provinces by middlemen. On sea products, the catch are usually processed into dried fish and some are frozen and shipped to neighboring provinces also by middlemen. The province maintains its supply of non-locally available goods through local businesses that regularly move goods from major cities using cargo trucks loaded to roll – on – roll – off (Roro) sea vessels in ports that connect to Masbate province on a daily basis. When the pandemic struck, travel restrictions imposed by the government severely disrupted goods movement thus highlighting the vulnerability of this method of access to essential and basic household goods.

Understanding the vulnerabilities of the food system in a country level is necessary in order to mitigate the effects of disruptions (Moseley & Battersby, 2020; Sreenonchai & Arunrat, 2021). The transport restrictions have also introduced food and nutrition insecurity even to well – off families briefly but further exacerbated the situation of families already living within and below the poverty threshold (Bhowmik et al., 2021). Ironically, these poverty stricken families largely belong to the farming and fishing sector who are supposed to be the community's food supply providers. Commodities and farming and fishing supplies had become scarce thus driving the price high despite price regulation by the government (Naz, 2022).

With the food providers severely affected and food movement disrupted, communities during the early months of the pandemic experienced having a limited range of food options such as meat (Hobbs, 2021) and other commodities. Having a limited range of food choices contributes to poor diet among the people thus a testament of food insecurity (Litton & Beavers, 2021) however this is just one of the multiple food insecurity dimensions (Gross et al., 2000) that needs to be considered.

As all struggled to find solutions, the need for reliable and timely data that will allow policy – makers to understand the real situation became evident and pressing. These data range from community sectors' profile to knowing the efficacy of the sector's response to the situation (Boyacı-Gündüz et al., 2021). The data could serve as determinants of household food security and diversity of food available for consumption (Kundu et al., 2021). Data on age of farming and fisher folks as intervention decision point consideration since the often non – mechanized labor requires the agility and strength of young workers. Unfortunately, the lack or absence of local data among community sectors results to poor/ haphazard decision making by the authorities and could be among the major factors contributing to non – appropriate or non – responsive government interventions (Nel et al., 2023).

The level of income of a community sector is another factor for consideration. Like their counterparts in other provinces, Masbate farmers and fisher folks low income during off harvest time or while passing a worse sea condition (Irene, 2017) may mean failing to sustain provision of ample and healthy food for the family. As a solution, most of them borrow from lenders thereby placing them in an almost unending debt cycle. Finding alternative sources of income should have been the ideal way to broaden their source of resilience (Manlosa et al., 2021) however the opportunities for them is slim. While the government addressed this dire situation through cash dole outs, the clamor of the farmers and fisher folks is a sustained source of income thus the need for both short and long term government responses (Bennett et al., 2020).

Figure 1.*The Philippines and the Province of Masbate*

Another consideration is the educational attainment that plays a vital role in the health and economic situation of farming and fishing families (Rosales et al., 2023). Alternative jobs requiring higher level of education and skills that most of them do not possess prevents them from getting hired. Quickly deciphering instructions and protocols was also a challenge due to their low comprehension levels. Their response is often a combination of panic, anger and resentment to authorities thus exacerbating the already slow and insufficient government response that in turn worsened food insecurity. Interestingly, while low level of education could be the culprit of the hardships, it was noted that in the US, it was the highly educated that experienced higher level of food insecurity

(Reimold et al., 2021). It was also found out that in rural Guatemala it is the higher income families that experienced significant reduction in food diversity as compared to the low income family (Ceballos et al., 2021). These situations show the capability of the pandemic to introduce food and nutrition insecurity regardless of life status. The need to provide vulnerable sectors with food aid, financial assistance and institutional livelihood assistance to ward – off hunger during lean times should be emphasized (Manlosa et al., 2021). Food and nutrition security can only be achieved when all people have, when needed, physical, social, and economic access to adequate, safe (free of contaminants), and nutritious food to satisfy their dietary needs and choices for an active and healthy life. Furthermore, food security and nutrition does not mean a filled stomach and thus feeling hungry is just one factor. Additionally, food and nutrition related health advisories from the WHO are regularly issued in order to give the people a fighting chance in case they get Covid – 19 (Simelane et al., 2020). With the food insecurity happening, the farmers and fisher folk could just wonder whether they can heed what is being said in the advisory.

The willingness of the farmers and fisher folks to survive prompted them to institute coping mechanisms. Some of them engaged in small scale money – making tasks referred locally as *raket* (a term used when engaging in alternative, short –term, opportunity – based, informal, and modest income generating activities). There was also an innovative idea espoused by a Filipina named Patricia Non where people share their excess goods and in return is free to pick items they need . There were also some top government officials who bought farm products directly from the farmers for distribution at community pantries. The, ‘multi – functional’ character of these “small farms” make them more productive and more efficient and when sustained could potentially contribute to more economic development than large farms (Rosset, 2000). This initiative has the great potential to fill the government response gap to basic community needs. These idea however is still varied views by homestead, backyard farming, and industrial/corporate farming advocates in terms of its perceived economic, environmental, spiritual and health contribution contributions (Deng et al., 2023; Rangarajan & Riordan, 2019).

Judicious consumption of food during the pandemic also emerged as people became conscious about food wastage. Studies have shown that roughly a third of the food produced in the world every year is wasted and approximately 1.3 Billion tons of the food produced never reaches the human stomach (Grandhi & Appaiah Singh, 2016) thus a troubling scenario. Other measures such as judicious use of household resources to lessen utility bills and other belt – tightening measures were also instituted.

In terms of leading a health conscious life, habits such as handwashing, physical

distancing and limiting the number of social contacts (Riiser et al., 2020) and promotion of healthy eating (Litton & Beavers, 2021) were observed by many. Mental health also became of paramount consideration to mitigate the negative effects of anxiety, depression and distress (Aknin et al., 2022). Efforts on strengthening emotional stability have resulted to what was referred to as getting the chance to rediscover goodness within the three dimensions of suffering i.e. *sakit* (pain), *pighati* (grief) and *pag – asa* (hope) (Cordero, 2021). Related to this, two opposing negative emotions i.e. a carefree extreme individualist attitude and the deep fear of an impending painful death were elicited.

While some people predict that the virus may be later categorized as a common flu, developing immune system and getting vaccinated would make them resistant however some were already traumatized thus family processes that could mitigate the risks associated to Covid 19 and promotion of resilience within the household is paramount (Prime et al., 2020).

While Filipinos consider themselves resilient, the call for a much well –defined and well – implemented government program have grown stronger. Filipinos now believe that overly romanticizing resilience must be stopped and authorities must take concrete and tangible actions by exerting efforts to fully understand the varying local situations. Resilience should not only be focused on the people but the government’s resistance, protection, anticipation, and preparedness during changes and disruptions (Boyacı-Gündüz et al., 2021; Carlson et al., 2012; Van Breda, 2018).

This study highlights the situation of the farmers and fisher folks of the province of Masbate, Philippines as to their age, educational attainment, sex and livelihood tasks they engage with when not working in the farm or not engaged in fishing and their monthly income range. Apart from getting these information, narratives of their experiences will foster understanding of their personal and family conditions as well as the local situation that would enable the researchers to propose ways to help reduce food and nutrition insecurity. Some complex questions that need answers are – what policies or programs can be proposed so that the farmers and the fisher folks of Masbate and perhaps those from around the world with similar predicaments can be lifted from hardships worsened by the pandemic? And, is there a full – fledged action plan (Dash et al., 2021) a perspective (Hege et al., 2021) and a framework or a guide that could be used to resist and recover from similar future events? Envisioning a post pandemic period for Masbate based on a robust planning framework is challenging and at the same time exciting as both farmers and fisher folks. Those who have already set their pre pandemic aspirations on the future of their children (Palis, 2020) may have to recalibrate it in a guided manner and with a holistic and community inclusive

perspective (Balasuriya et al., 2021).

Methodology

Randomly selected farmers and fisher folk were profiled in terms of age, educational attainment and sex from November 2023 until February 2024 throughout the province's accessible and peaceful farming and fishing communities. Descriptive statistics (frequency and percentage) were used to analyze the data derived from questionnaire – checklist containing items that would constitute the profile of the respondents. Interview with selected respondents and non – participant observation of the locale's situation allowed for a richer narrative of the respondents' living conditions while at the same time serving as outright validation of their demographic information.

To further understand the experiences of the respondents and their social dynamics as a group, an FGD composed of 9 respondent from the farmers and fisher folks group was conducted. It was observed that mixing them provided a much richer narrative since farmers often alternate as fishers so with the fishers who also alternate as farmers from time to time and when situation allows. Smith's Interpretative Phenomenological Analysis was use to analyze and understand the FGD respondents' lived experiences. Free consent from the respondents to participate was sought with a guarantee that no personally identifiable information will be reported in any form. The analysis of the interview and FGD narratives were presented to some respondents to allow them to correct or refute error in interpretation that may have been committed by the author. The analysis of the results and the validated FGD report contributed to the crafting of the proposed action points, policies and the food and nutrition security planning framework contextualized to economically depressed and remote island provinces.

Results and Discussion

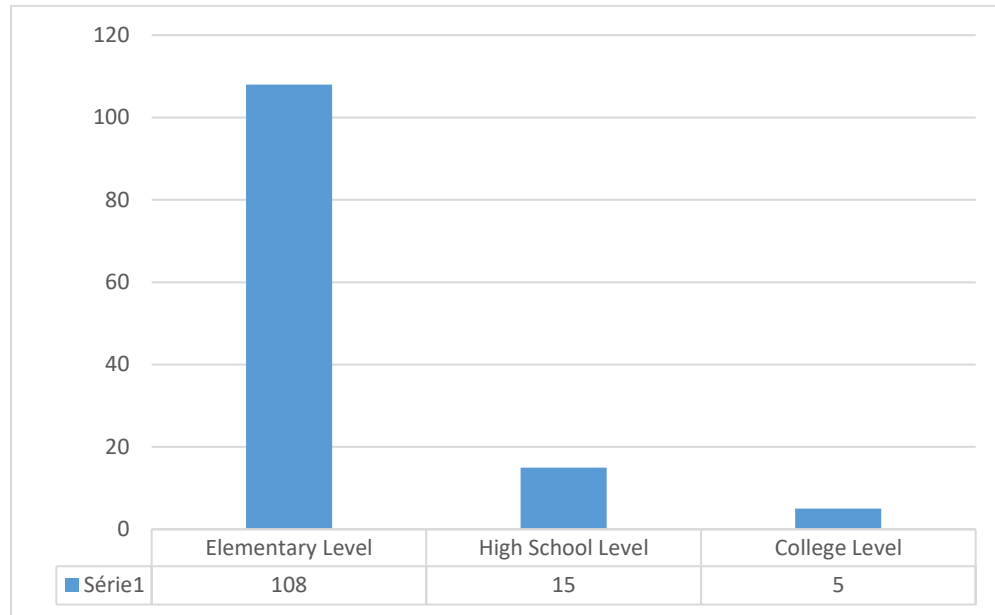
The study's respondents were 128 farmers and fisher folk aged 19 to 65. The respondents' profiles indicated that young and senior farmers and fisher folks constitute this sector in the province of Masbate. Interviews with them revealed that both groups alternate fishing and farming activities and the strength of the young and the experience of the seniors became complementary in performing their tasks and in transferring artisanal skills in farming and fishing.

Females constituted 48.4% of the total respondents, while males constituted the other 51.6%. Sex also separates males and females in terms of responsibilities, i.e., males engage in heavy farm or fishing labor, while females are engaged in catch processing and marketing. The majority of the farmers work in ranches, coconut farms, and aquaculture farms, while the fisher folks are either fishing crews or work as freelance or artisanal fishers.

Figure 2 shows the combined educational profile of the farmers and fisher folks. It could be gleaned from the figure that the majority of the farmers and the fisher folks are within the elementary education level. Interviews with them revealed reasons such as early exposure to hard farming and fishing labor that effectively prevented them from attending school. Many said that they started skipping classes to do hard labor to help their parents earn income thus preventing them from devoting time for studies. The lack of time, according to them, resulted in poor performance in school, which ultimately discouraged most, if not all, of them from pursuing higher levels of study. This was the common response of both farmers and fisher folks who are already in their 40's to 60's age bracket. In contrast, those who reached high school level are in their late 20s and 30s age bracket, while those who are in college are sons and daughters (19 – 25 years old age bracket) of farmers and fisher folks who only assist their parents during weekends and class term breaks.

In terms of income range, the respondents indicated a maximum of Php5,000.00 per month or approximately USD90 per month. This level of income is way below the poverty threshold of the Philippines which pegs to Php15,000 a monthly income for a family of five members based from the Philippine Statistics Authority 2023 report. Asked about their ways of augmenting the family income, almost all of them said that their family members resort to other means of informal and irregular source of livelihood such as working as caretakers of children in well-off families within the locale, alternating between farming and fishing i.e. while waiting for the harvest of their crops, farmers go fishing with family members and friends in the locale while fisher folks engage in farming during unfavorable sea conditions (Figure 3).

Figure 2.
Combined Educational Attainment Status of the Farmer and Fisher folk Respondents

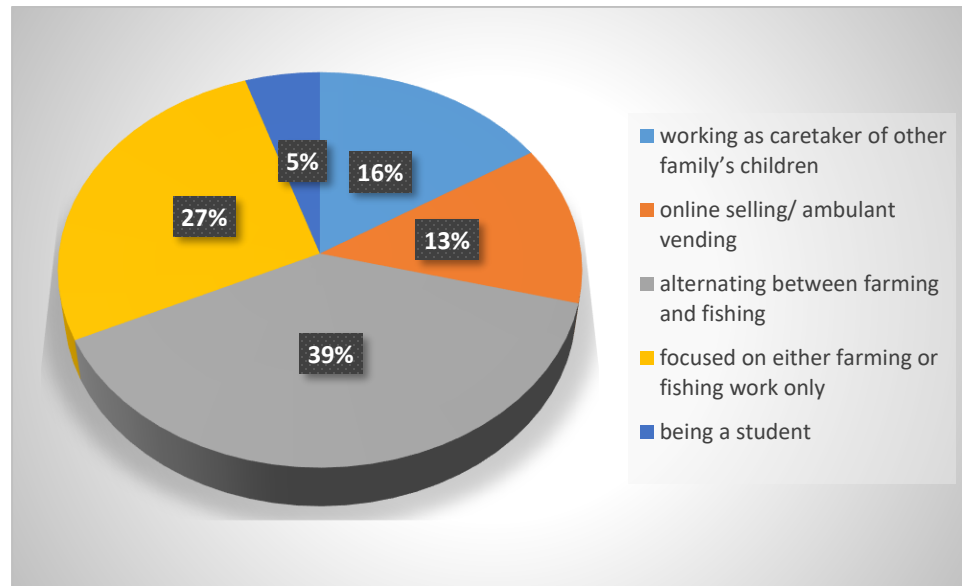


Data also revealed that only 33% of the farmer respondents own a piece of land ranging from less than a hectare to at least 3 hectares in size, while fisher folks settle in small residential lands adjacent to the coast they inherited from their parents or seek permission from coastal lot owners to freely park their small boats and store the fishing nets.

Unlike their experience before with their parents, both the farmers and fisher folks have now set education as priority for their children. All of them said that they see college graduation of their sons or daughters as their means of emancipation from the gripping poverty.

Thematic analysis of the respondents’ experiences narrative during the FGD revealed five emerging themes namely: (1) Food shortage (2) difficulty in accessing food (3) involuntary hunger (4) voluntary hunger (5) disorganized relief goods assistance from authorities. These inconveniences prompted them to institute coping mechanisms that allowed them to endure the brunt of the pandemic.

Figure 3.
Tasks Engaged by the Respondents aside from Farming or Fishing



Pertaining to the *Food Shortage Theme*, it was revealed by the respondents that their lack of money to buy foods and mobility restrictions during the imposition of the strictest community quarantine and the high market price exacerbated food shortage in their family. Coastal residents lamented that while it is quite convenient for them to get food from the sea the restrictions imposed prevented them from foraging longer to gather shellfish, edible seaweeds, engage in net fishing and head out farther at sea to reach good fishing spots. Others expressed that the situation made them stressed and fearful of Covid – 19 thus resulting to loss of appetite.

Pertaining to *Difficulty in Accessing Food Theme*, apart from not being able to go out at will to tend their farms or fish, various complains about disorganized distribution and poor quality rice (smelly rice) being distributed allegedly coming from old stocks at the government warehouse were also raised. There were also allegations of not getting the promised quantity of rice and being considered the least priority due to a different political affiliation. These situation typifies the failure of the government to plan ahead the best method of relief goods distribution. When asked about the kind of food they want for their family, they enumerated the common ones that could fill their stomach without careful consideration of the food's nutritional properties. This scenario is an indicator of food and nutrition insecurity.

The respondents from *Burias* Island has the worse experience. Still reeling from the destruction of Typhoon *Kammuri* locally known as Typhoon *Tisoy* damage last December 2019 and the March 2020 El Niño phenomenon that significantly reduced their harvest the pandemic further worsened the situation. This highlights their high vulnerability to disasters due to lack of safety nets.

Pertaining to the theme *Involuntary Hunger*, since majority of the towns in the province are coastal towns, it is not uncommon for farmers to alternate as fishers and also for some fisher folks who have small land holdings to do farming. This practice provides their family food for the day or for days and allowed them to meet ends somehow. The excess of their produce are sold to the market or to bulk buyers/ middlemen thus while the income is meager they seldom experience involuntary hunger prior to the pandemic. It was also revealed that their practice of uni-cropping or caring for small farm animals or chicken was not able to provide the necessary food and nutrition security. When asked about the reasons for this farming practice, most of them said that they usually or traditionally depend on the produce of their neighbors in exchange for what they have or rely to goods available in the market.

Pertaining to the theme *Voluntary Hunger*, the respondents also cited that mobility restrictions during lockdowns prevented them from tending their farm or heading out to sea for fishing thus resulting to a limited food option. Their coping mechanism is to reduce their food intake and spare the rice and viand coming from government assistance for their young children. According to respondents from upland areas, they have to consume vegetables and crops entirely for at least two to three days per week and allot the rice and canned goods for their small children. They said that their small children who cannot yet understand the situation would throw tantrums for not being able to eat rice and a modest viand.

Pertaining to the theme *Disorganized Relief Goods Assistance* from authorities, it was found out that some respondents residing in far flung barangays were not able to receive goods from the local government. There were allegations ranging from laziness and irresponsibility of those assigned to distribute goods who consider heading to far flung barangays as a tedious task thus they favor only those who are close by. There were also allegations of not receiving goods and other forms of assistance due to political affiliations which means that voters of the incumbent local official receive most of the assistance or are considered high priority families during distribution.

It was only the time when the community quarantine was relaxed were they able to return to their practice of alternating between farming and fishing tasks to feed their family, bartering goods, doing *raket* such as ambulant vending, online selling and short - term

manual labor (a few days to a week) in local government offices, neighbor's farms and at sea. These *raket* Others who have family members working in major cities were able to receive financial assistance however others said that they were the ones who provided financial assistance to their family members who lost their job.

Some respondents also said that they have experienced only mobility issues during the pandemic since their ranch – owner - employer provided them food and other needs. Their only lament is the absence of a good electrical supply in their *barangay* that prevents them from storing raw foods in freezers.

Conclusion

The farmers and the fisher folks of Masbate, Philippines may have once more proven their resilience to the food and nutrition security threat brought by the pandemic. In a desperate effort to emotionally buffer the suffering, it has been the prevailing practice by the public and most authorities to flaunt the brand of Filipino Resilience shown during disasters. Intellectuals and action/result - oriented individuals have already commented that resilience should not be overly romanticized nor generalized since it is still the government authorities' responsibility to help struggling Filipinos. The tendency to romanticize Filipino resiliency is similar to covertly saying the passage "*ipasa Diyos nalang*" ("Place it in God's hand) or the "*bahala na*" attitude ("come what may" attitude) thus freeing the authorities to serious responsibility of attending to the welfare of its people. In order to give the community a good fighting chance during health disasters, complacency must be stopped by instituting modern measures such as the use of a data – driven decision making tools that leverage the affordances provided by ICT. Furthermore, food and nutrition security action points and policies may be formulated to further strengthen future disaster response.

Recommendations

In the light of the respondents' demographic situation, experiences and coping mechanisms that was revealed in this study, the following food security and nutrition action points, policies and a planning framework are recommended:

Food and nutrition security action points

1. Equipping the farmers and fisher folks and their family members with relevant skills trainings in ICT, e – marketing, and other skills training to increase their range of alternative livelihood opportunities;
2. Enhancement, contextualization, and proper monitoring of existing farm and fishing sector government programs/ assistance to make it more responsive to local needs.

3. Provision of irrigation systems operationalized by smart water management system to allow all season farming activities;
4. Establishment of “smart” and regenerative communal farms and smart sea resources management in partnership with the academe’s research and development unit to enhance food security and broaden food source resilience;
5. Establishment of people’s – organization – managed products auction site in partnership with the academe and the business sector;
6. Strengthening the operational capability of the people’s organization through staff training and effective applicant selection and hiring, preferably from members;
7. Lobbying for support on the establishment of farm and sea products processing plants to provide the farmer and fisher folk families with alternative sources of livelihood;
8. Establishment of a locally – managed database system that will handle updated profiles of the local farmers and fisher folks, crop data, farm management data, sales/ marketing data, and analytics as a decision support system;
9. Implementation of measures that will ensure continuity of the farm and fisher folk strategic development plan.

Food and nutrition security policies

1. Widening the scope and vigorous implementation of accessible and inclusive education initiatives for the school age children of the farmers and fisher folks through socialized tuition fee scheme, scholarships, and other forms of educational assistance;
2. Fostering involvement and active participation of farmers and fisher folks in community decision making from the *barangay*, municipal and district levels;
3. Promulgation of local ordinances such as accreditation of middlemen who wants to join sea farm and sea product farm gate/ sea products auction and transport to regulate prices for the benefit of all;

Food and nutrition security planning framework for economically depressed and remote island provinces

Information gained from the study in combination with information found in selected literatures facilitated the conceptualization of the Smart *Sirungan* Framework shown in Figure 4. SEARCA’s Transformation Framework presented by Gregorio & Ancog last 2020 influenced the creation of this framework particularly in the area of Ecosystem Thinking characterized by a circular value chain. The Masbateño term *Sirungan* translates to the English word – Shelter. The term was chosen to denote a shelter or refuge for farmers

and fisher folks and even other people during disasters. This study attempts also to fill the absence of a planning framework suited for a remote and economically – depressed province in the Philippines and perhaps other countries with similar situation.

Under the SMART Farm and Sea Products Source Component, ICT – based data and information on the basic food needs of the locals will serve as basis in decision – making that includes farming and fishing information, security and disaster mitigation inputs and many others. Environmental management data and information will also be available to help the community and concerned agencies nurture natural resources to allow regeneration. As this component transition to the second component, block chain technology will be applied to ensure traceability of actions. Collaboration with the people organization academe industry and government will be established along the area of research and development.

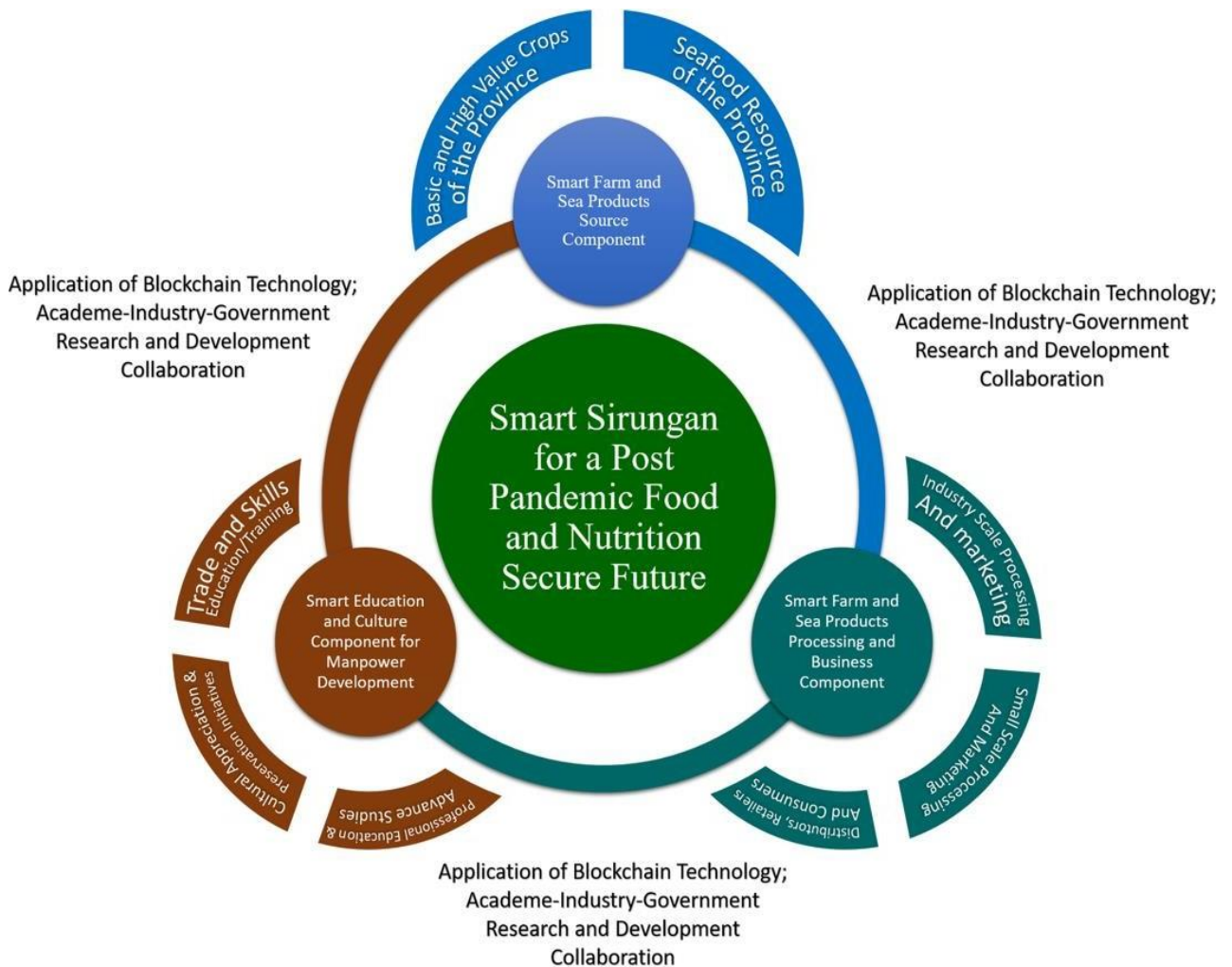
Under the SMART Farm and Sea Products Processing and Business Component, the Industry Scale Processing and Marketing sub component will handle products processing for the distributors, retailers and consumers. Products processing will be handled by large companies to make the products highly available while the Small Scale Processing and Marketing sub component that includes home – based processing and cooperative – based processing will cater to the local market. As component 2 transitions to component 3, the same collaborative groups will be established along research and development.

Sustained pool of well – educated and skilled manpower will be handled by the Smart Education and Culture Component. Enough manpower capable of managing farm and sea products source to ensure regeneration and to handle processing and business management in all levels is necessary.

Finally, knowing that people come and go in communities and organizations for varied reasons, there must be a *Sirungan* that will serve as a core, resource provider and convergence point. Central to the operation of the framework is a reliable and accessible ICT – driven data and information repository. It is hoped that the framework can serve as basis in formulating and operationalizing programs that will help ensure a Post Pandemic Food and Nutrition Secure Future and will allow the province to formulate plans guided by a common and highly contextualized framework that was previously unavailable.

Figure 4.

Proposed Smart Sirungan Framework for a Food and Nutrition – Secure Future



REFERENCES

Abenir, M. A. D., Manzanero, L. I. O., & Bollettino, V. (2022). Community-based leadership in disaster resilience: The case of small island community in Hagonoy, Bulacan, Philippines. *International Journal of Disaster Risk Reduction*, 71, 102797. <https://doi.org/10.1016/j.ijdr.2022.102797>

Aknin, L., Neve, J. De, ... E. D.-P. on, & 2022, undefined. (2022). Mental health during the first year of the COVID-19 pandemic: A review and recommendations for moving forward. *Journals.Sagepub.Com* LB Aknin, JE De Neve, EW Dunn, DE Fancourt, E Goldberg, JF

- Helliwell, SP Jones, E Karam Perspectives on Psychological Science, 2022•journals.Sagepub.Com, 17(4), 915–936.
<https://doi.org/10.1177/17456916211029964>
- Balasuriya, L., Berkowitz, S. A., & Seligman, H. K. (2021). Federal Nutrition Programs after the Pandemic: Learning from P-EBT and SNAP to Create the Next Generation of Food Safety Net Programs. In *Inquiry (United States)* (Vol. 58). SAGE Publications Inc.
<https://doi.org/10.1177/00469580211005190>
- Bennett, N. J., Finkbeiner, E. M., Ban, N. C., Belhabib, D., Jupiter, S. D., Kittinger, J. N., Mangubhai, S., Scholtens, J., Gill, D., & Christie, P. (2020). The COVID-19 Pandemic, Small-Scale Fisheries and Coastal Fishing Communities. *Coastal Management*, 48(4), 336–347. <https://doi.org/10.1080/08920753.2020.1766937>
- Bhavani, R., Brief, P. R.-O. I., & 2020, U. (2020). Harnessing Agriculture for Achieving the SDGs on Poverty and Zero Hunger RV BHAVANI PRIYA RAMPAL 2. In *orfonline.orgR Bhavani, P RampalORF Issue Brief, 2020•orfonline.org*.
<https://www.orfonline.org/public/uploads/posts/pdf/20230511105728.pdf>
- Bhowmik, J., Selim, S. A., Irfanullah, H. M., Shuchi, J. S., Sultana, R., & Ahmed, S. G. (2021). Resilience of small-scale marine fishers of Bangladesh against the COVID-19 pandemic and the 65-day fishing ban. *Marine Policy*, 134.
<https://doi.org/10.1016/j.marpol.2021.104794>
- Boyacı-Gündüz, C. P., Ibrahim, S. A., Wei, O. C., & Galanakis, C. M. (2021). Transformation of the food sector: Security and resilience during the covid-19 pandemic. In *Foods* (Vol. 10, Issue 3). <https://doi.org/10.3390/foods10030497>
- Carlson, J., Haffenden, R., Bassett, G., & Buehring, W. (2012). *Resilience: Theory and Application*. <https://www.osti.gov/biblio/1044521>
- Ceballos, F., Hernandez, M. A., & Paz, C. (2021). Short-term impacts of COVID-19 on food security and nutrition in rural Guatemala: Phone-based farm household survey evidence. *Agricultural Economics (United Kingdom)*, 52(3), 477–494.
<https://doi.org/10.1111/AGEC.12629>
- Cordero, D. A. (2021). Sákit Pighati and Pag-asa: A Pastoral Reflection on Suffering During the COVID-19 Pandemic in the Philippines. *Journal of Religion and Health*, 60(3), 1521–1542. <https://doi.org/10.1007/s10943-021-01234-5>
- Dash, P., Espa, I., Sembla, F., Häberli, C., & Kansal, S. (2021). *Agricultural trade in a post-pandemic world*. https://www.wti.org/media/filer_public/f8/98/f898fda3-7066-4ef6-8f24-ca08b0c11561/dash_et_al_t20_-_tf3_agricultural-trade-in-a-post-pandemic-world.pdf

- Deng, T., van den Berg, M., Heerink, N., Cui, H., Tan, F., & Fan, S. (2023). Can homestead gardens improve rural households' vegetable consumption? Evidence from three provinces in China. *Agribusiness*, 39(S1), 1578–1594. <https://doi.org/10.1002/agr.21855>
- Grandhi, B., & Appaiah Singh, J. (2016). What a Waste! A Study of Food Wastage Behavior in Singapore. *Journal of Food Products Marketing*, 22(4), 471–485. <https://doi.org/10.1080/10454446.2014.885863>
- Gross, R., Schoeneberger, H., Pfeifer, H., & Preuss, H. (2000). *Four dimensions of food and nutrition security: definitions and concepts*. <https://www.cabidigitallibrary.org/doi/full/10.5555/20003016751>
- Hege, A. S., McCormick, N., Robinson, P., Charles, K. M., Jones, J., & Aft, E. (2021). Perspectives from the front line: The post-pandemic emergency food system in North Carolina. *Journal of Agriculture, Food Systems, and Community Development*, 10(2), 241–245. <https://doi.org/10.5304/jafscd.2021.102.018>
- Hobbs, J. E. (2021). Food supply chain resilience and the COVID-19 pandemic: What have we learned? *Canadian Journal of Agricultural Economics*, 69(2), 189–196. <https://doi.org/10.1111/cjag.12279>
- Hoffmann, R., & Muttarak, R. (2017). Learn from the Past, Prepare for the Future: Impacts of Education and Experience on Disaster Preparedness in the Philippines and Thailand. *World Development*, 96, 32–51. <https://doi.org/10.1016/j.worlddev.2017.02.016>
- Irene, E. A. (2017). Status of farmers and fishers turned pedicab drivers of Catbalogan City, Philippines. *Journal of Academic Research*. https://www.researchgate.net/profile/Elmer-Irene/publication/304773015_Status_of_Farmers_and_Fishers_Turned_Tricycle_Drivers/links/599ee645a6fdcc500355dd23/Status-of-Farmers-and-Fishers-Turned-Tricycle-Drivers.pdf
- Koirala, K. H., Mishra, A., & Mohanty, S. (2016). Impact of land ownership on productivity and efficiency of rice farmers: The case of the Philippines. *Land Use Policy*, 50, 371–378. <https://doi.org/10.1016/j.landusepol.2015.10.001>
- Kundu, S., Banna, M. H. Al, Sayeed, A., Sultana, M. S., Brazendale, K., Harris, J., Mandal, M., Jahan, I., Abid, M. T., & Khan, M. S. I. (2021). Determinants of household food security and dietary diversity during the COVID-19 pandemic in Bangladesh. *Public Health Nutrition*, 24(5), 1079–1087. <https://doi.org/10.1017/S1368980020005042>
- Litton, M. M., & Beavers, A. W. (2021). The relationship between food security status and fruit and vegetable intake during the covid-19 pandemic. *Nutrients*, 13(3), 1–14. <https://doi.org/10.3390/nu13030712>

- Manlosa, A. O., Hornidge, A. K., & Schlüter, A. (2021). Aquaculture-capture fisheries nexus under Covid-19: impacts, diversity, and social-ecological resilience. *Maritime Studies*, 20(1), 75–85. <https://doi.org/10.1007/S40152-021-00213-6>
- Moseley, W. G., & Battersby, J. (2020). The Vulnerability and Resilience of African Food Systems, Food Security, and Nutrition in the Context of the COVID-19 Pandemic. In *African Studies Review* (Vol. 63, Issue 3, pp. 449–461). <https://doi.org/10.1017/asr.2020.72>
- Naz, G. M. (2022). Effect of Covid-19 Pandemic to the Fishers in a Coastal Municipality in the Philippines. *International Journal of Multidisciplinary: Applied Business and Education Research*, 3(6), 967–976. <https://doi.org/10.11594/ijmaber.03.06.02>
- Nel, E., MacLachlan, A., Ballinger, O., Cole, H., & Cole, M. (2023). Data-Driven Decision Making in Response to the COVID-19 Pandemic: A City of Cape Town Case Study. *Sustainability (Switzerland)*, 15(3), 1853. <https://doi.org/10.3390/su15031853>
- Palis, F. G. (2020). Aging filipino rice farmers and their aspirations for their children. *Philippine Journal of Science*, 149(2), 321–331. <https://doi.org/10.56899/149.02.10>
- Prime, H., Wade, M., & Browne, D. T. (2020). Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist*, 75(5), 631–643. <https://doi.org/10.1037/amp0000660>
- Rangarajan, A., & Riordan, M. (2019). *The promise of urban agriculture: National study of commercial farming in urban areas*. <https://ageconsearch.umn.edu/record/320850/>
- Reimold, A. E., Grummon, A. H., Taillie, L. S., Brewer, N. T., Rimm, E. B., & Hall, M. G. (2021). Barriers and facilitators to achieving food security during the COVID-19 pandemic. *Preventive Medicine Reports*, 23. <https://doi.org/10.1016/j.pmedr.2021.101500>
- Riiser, K., Helseth, S., Haraldstad, K., Torbjørnsen, A., & Richardsen, K. R. (2020). Adolescents' health literacy, health protective measures, and health-related quality of life during the Covid-19 pandemic. *PLoS ONE*, 15(8 august). <https://doi.org/10.1371/JOURNAL.PONE.0238161>
- Rosales, A., Young, S., Mendez, T., Shelden, K., & Holdaway, M. (2023). Collaborative Strategies to Improve Nutrition Security and Education: Lessons Learned During a Pandemic. *Journal of School Health*, 93(2), 148–152. <https://doi.org/10.1111/josh.13247>
- Rosset, P. (2000). The multiple functions and benefits of small farm agriculture in the context of global trade negotiations1. *Development (Basingstoke)*, 43(2), 77–82. <https://doi.org/10.1057/PALGRAVE.DEVELOPMENT.1110149>
- Sreenonchai, S., & Arunrat, N. (2021). Understanding food security behaviors during the covid-19 pandemic in thailand: A review. In *Agronomy* (Vol. 11, Issue 3).

<https://doi.org/10.3390/agronomy11030497>

Simelane, K., Bulletin, S. W.-F. and N., & 2020, undefined. (2020). Food and nutrition security theory. *Journals.Sagepub.ComKS Simelane, S WorthFood and Nutrition Bulletin, 2020•journals.Sagepub.Com, 41(3), 367–379.*

<https://doi.org/10.1177/0379572120925341>

Van Breda, A. D. (2018). A critical review of resilience theory and its relevance for social work. In *Social Work (South Africa)* (Vol. 54, Issue 1, pp. 1–18). <https://doi.org/10.15270/54-1-611>