

Sustainability Assessment of Calamba Fisherfolks Producers Cooperative (CFPC) in Calamba City, Laguna, Philippines

Abstract

Aims: To assess the sustainability of a cooperative, the Cooperative Fisherfolks Producers Cooperative (CFPC) in Calamba City, Laguna.

Study design: The study design was primarily qualitative utilizing United Nation- Food and Agriculture Organization's (UN-FAO) sustainability assessment food and agriculture (SAFA).

Place and Duration of Study: Specifically, data was collected from thirty Calamba fishermen in July 2022 that served as the primary data source and is complemented by relevant secondary data analysis. The goal of the inquiry is to thoroughly assess the sustainability of CFPC from an ecological, economic, social and governance standpoint. It is in accordance with the standards specified in the SAFA Framework.

Methodology: UN-FAO's SAFA guidelines/tool addressing the sustainability pillars of: socio, economic, environmental and governance were employed to the CPFC's management/ officers through interviews (using questionnaire) and focus group discussion (FGD). Along with this, were the consultations made with the cooperative officers, experts and the industry. Secondary data were also analyzed to support the responses made by the respondents.

Results: CFPC is vulnerable to typhoons and to fishkill due to the degrading quality of water in the Laguna Lake. The issues also included the unstable volume of production that resulted to net losses, especially during the lean season. Consequently, the study found a low to moderate sustainability score in terms of environmental integrity and economic resiliency. On the other hand, the study found a moderate rating on good governance and social responsibility due to active government support, aid provided by the cooperative to its members, and gender equality.

Conclusion: Establishment of impact and performance assessment within the CFPC, utilization of effective microorganism (EM)/ probiotics in Laguna de bay and construction of inland hatchery for quality fry/fingerlings.

25
26 *Keywords: Sustainability, Cooperative, Tilapia, Social, Economic, Environment, Governance*
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28 **1. INTRODUCTION**

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30 Sustainability stands as a fundamental concern for contemporary society, and the advancement of improved and more
31 sustainable food systems plays a pivotal role in addressing these concerns (Alroe, 2016). While small scale fisheries
32 constitute the most significant source of employment within the ocean economy, FAO (2022) reported that there is a decline
33 in the proportion of fish populations harvested sustainably, decreasing from 90% to 64.6% between 1974 and 2019.
34 However, having a collective action, such as forming a cooperative, can facilitate sustainable fishing practices as fishing
35 communities take the initiative to formulate and enforce regulations that govern access to and utilization of their communal
36 fishing resources. With this, Calamba Fisherfolks Producers Cooperative (CFPC), a cooperative composed of smallholder
37 fisherfolks who are mostly engaged in capture fisheries of tilapia from the nearby Laguna Lake, which is characterized as
38 the largest lake in the country and the second-largest lake in Southeast Asia, offers a variety of benefits with fishing being
39 the most significant. However, with its continuous dwindling water quality of the lake as a result of the escalating influx of
40 waste originating from agricultural run-off, soil erosion, domestic origins, and industrial discharges, it can also pose a threat
41 to overall social, economic, and environmental aspects of sustainable development.

42 Laguna Lake, with its vast area, plays a crucial role in the economic and environmental landscape. It generates income
43 through aquaculture and capture fisheries, as well as water that is utilized for domestic, industrial, and agricultural needs.
44 In addition, it facilitates the development of hydropower, reduces risk of flooding in the southern portions of Metro Manila,
45 and serves as a sink for surface water runoffs and water inflows from the Pasig River. Moreover, it has recreational potential
46 that has not been fully realized (Palanca-Tan, 2020). Fisheries serve as the primary function of the lake. Between 1997 and
47 2000, the lake produced between 37,000 and 47,000 metric tons of fish, both from fish pens and capture fisheries (Masuda,
48 2019). In 2016, it generates gross annual revenue of Php 6.6 billion (US\$141.66 million) with its ecosystem contributing
49 about Php 2.8 billion (US\$60 million) annually to its economic activity.

50 Fish production of the lake was declining even before the fish pen for milkfish culture was introduced in the early 1970s.
51 The algal standing crop recommended 20,000 hectares for fish pen culture without affecting open-water fisheries
52 (Delmendo, 1976). However, by the mid-1980s, this area had expanded to 30,000–35,000 hectares (LLDA, 1990; Valerio,
53 1990). Afterward, fish pens shrank to 7,000 hectares in 1992. (Delos Reyes, 1995). Despite this decrease in fish pen
54 coverage, the productivity of open-water fisheries continued to decline. Since 2002, the maturation period for fish extended
55 to 9–12 months, compared to the previous 4–5 months.

56 Calamba City, Laguna has significant land areas dedicated to fishery owing to their respective location by Laguna Lake.
57 Calamba City has 771.18 hectares which is 6% of Calamba's land area. The city has agricultural production areas limited
58 to its eastern portion near Laguna Lake. A total of 1,925 hectares is dedicated to fisheries and agricultural production.

59 As of September 2016, 1,646 fishermen were registered in Calamba City. Six hundred ninety- seven engaged in full-time
60 capture fishing, 78 in aquaculture, 152 in fish vending and processing, 256 in fish labor, and 472 in part-time gleaning. In
61 addition, 630 municipal fishing vessels were registered with the City Government. The general objective of this research as
62 to assess the sustainability of the Calamba Fisherfolks Producers Cooperative (CFPC). Specifically, the study aimed to: (1)
63 present the profile of the Calamba Fisherfolks Producers Cooperative; (2) discuss the practices of the Calamba Fisherfolks
64 Producers Cooperative towards sustainability; (3) evaluate the sustainability of Calamba Fisherfolks Producers Cooperative
65 using the Sustainability Assessment of Food and Agricultural Systems (SAFA), and; (4) recommend strategies that could
66 improve the cooperative's sustainability.
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68 **2. MATERIAL AND METHODS**

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70 The study assessed the Calamba Fisherfolks Producers Cooperative (CFPC) using the Sustainability Assessment of Food
71 and Agriculture System (SAFA) by FAO 2014, incorporating the cooperative's four business function namely financial,
72 marketing, human resource, and production/operation. Through interviews, structured survey questionnaire, and focus
73 group discussions (FGDs), with 30 members of the cooperative, both quantitative and qualitative primary data were
74 gathered. Secondary data was also used in the form of the cooperative's By-Laws, updates from their social media account
75 and other sources like journals, news, and articles that would help support the study. The gathered information was used
76 to assess the cooperative with regards to their internal environment focusing on the four-business functions and their
77 external environment using the PESTLE (Political, Economic, Social, Technological, Legal and Environmental Analysis).
78 These were integrated in the SAFA framework, where the gaps and areas for improvement will be identified, and even their
79 highlights that could aid the formulation of recommendations to have a more sustainable activities within the cooperative.

The Sustainability Assessment of Food and Agriculture Systems (SAFA) framework was developed to assess how food and agriculture-related activities impact people and the environment. According to this framework, sustainable practices should be integrated into global food and agriculture systems in four dimensions: good governance, environmental integrity, economic resilience and social well-being. These are translated into 21 themes and 58 sub-themes for each of the sustainability pillars to produce an internationally recognized definition of sustainability. Specific objectives are outlined for the sub-themes, and goals are set for the themes. These goals can be measured and verified using the total of 116 indicators pertinent to food and agricultural supply chains. Guidelines on the application (calculation) of these indicators are provided by the SAFA Guidelines.

To better assess the information, the four main phases of the framework was followed which consists of: (1) mapping which establishes the goal of assessing the enterprise and setting the scope of the study, (2) contextualization which from its name, contextualize the indicators to be used in the assessment, (3) indicators which further refines the relevant contextualization and of subthemes through indicator selection, its scoring and accuracy rating, and (4) reporting which shows the results of the assessment through a visual representation using a polygon graph. The study used software, the SAFA tool version 2.4.1, for ease of processing the data which automatically generates the results and its corresponding graph.

The SAFA guidelines provide a 5-scale rating in which the best and unacceptable practices are indicated for each subtheme and the middle ratings are to be defined by the researcher based on context. Each subtheme is weighted based on the number of indicators for each subthemes. In instances that there are two indicators in a subtheme, the mean of the two scores is taken. As they have equal weight in the over-all subtheme score. If mean is not possible, the lower score the lower score is taken. The indicator rating the score and the percentage score was indicated in Table 1.

Table 1. Rating Score and Color for Each Indicator

Rating	Score	Percentage Score (%)
Best	5	80-100
Good	4	60-80
Moderate	3	40-60
Limited	2	20-40
Unacceptable	1	0-20

3. RESULTS AND DISCUSSION

Calamba Producers Fisherfolks Cooperative (CFPC) was established and registered as a cooperative in Cooperative Development Authority on July 17, 2017, and has 76 active members as of 2022 wherein 41 of them were male, and 35 were female. This cooperative is based in Calamba City, Laguna where the majority of its members reside among the 54 barangays that are located near the coast of Laguna Lake. With this, the lake plays a significant role in the function of the cooperative as it is also where they mostly harvest their produce, may it be through aquaculture or capture fisheries. The cooperative's main activities include the production of fish, like tilapia and bighead or *mamali* – but mostly tilapia; production, sale and rental of fishing equipment, fish processing, clean up drives, trainings and seminars, Bantay Lawa Program, and waste management.

Moreover, mapping provides the scope of the study with regards to assessing the sustainability of the enterprise is defined. Aside from being producers, the cooperative also play a huge role as input suppliers, especially since they also produce nets and boats for their fellow fisherfolks that are available for selling or rental. In addition, they also engage in tilapia processing that still depends on their level of harvests. Such produce either goes to traders that supply the produce to nearby areas, or directly to retailers that are only situated in their community. Figure 1 below shows the value chain of the fish industry in the Calamba in which the CFPC serves as one of the key enablers in the chain.

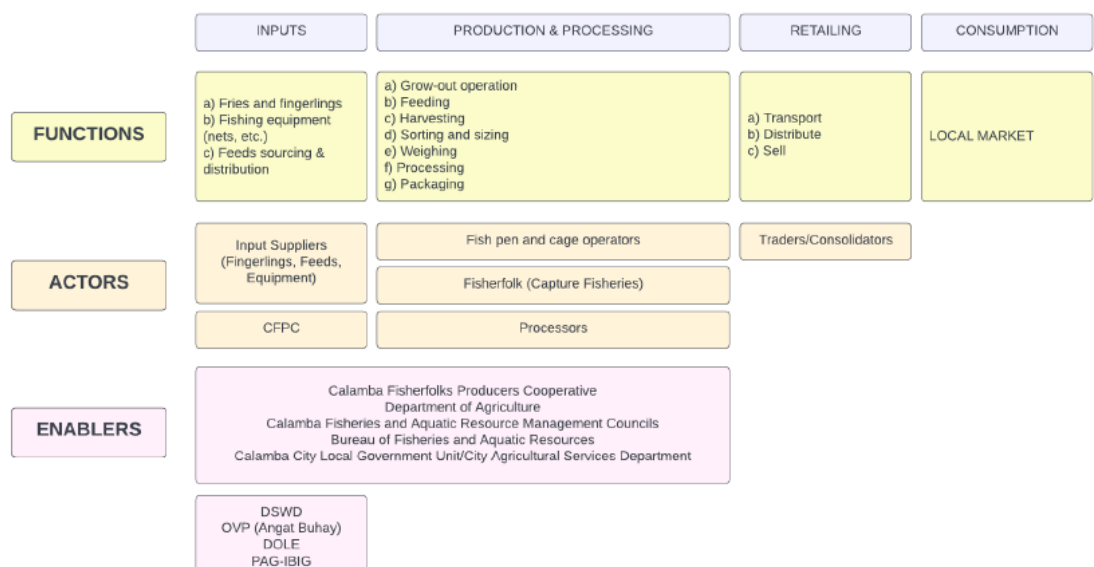


Figure 1. Value chain map of the fish industry in Calamba City

In this assessment, the study covers the inputs suppliers for fingerlings, feeds, and equipment, the CFPC and other fish producers in the area for the production and processing sectors, the traders, the market and the enablers as these are the actors that are directly linked to the cooperative.

Contextualization. In this section, the themes, sub-themes, and indicators as provided by the SAFA Framework were assessed whether they were deemed relevant or not for the assessment context.

Table 2 outlines the themes and subthemes that guide the evaluation of the cooperative's sustainability. On the other hand, Table 3 presents themes that were not included in the research, which are mainly related to the environmental integrity dimension. Notably, among the things left out are atmospheric and land-related themes. The cooperative's limited ability to provide such metrics makes a quantitative analysis of the atmospheric theme difficult, especially relative to its involvement in processing activities. Furthermore, the study's exclusion of themes related to land is justified by the cooperative's primary focus on fish production rather than its involvement in land-based agricultural activities.

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Table 2. List of included SAFA Themes

Dimension of Sustainability	Themes	Sub-themes
Good Governance	Corporate Ethics	Mission Statement, Due Diligence
	Accountability	Holistic Audits, Responsibility, Transparency
	Participation	Stakeholder Dialogue, Grievance Procedures, Conflict Resolution
	Rule of Law	Legitimacy, Remedy, Restoration, and Prevention, Civic Responsibility
	Holistic Management	Sustainability Management, Full-Cost Accounting
Environmental Integrity	Water	Water Withdrawal, Water Quality
	Biodiversity	Ecosystem Diversity, Species Diversity, Genetic Diversity,
	Materials and Energy	Material Use, Energy Use, Water Reduction and Disposal
	Animal Welfare	Animal Health, Freedom from Stress,
Economic Resilience	Investment	Internal Investment, Community Investment, Long-ranging investment, Profitability
	Vulnerability	Stability of production, stability of supply, stability of market, liquidity, risk management
	Product Quality and Information	Food Safety, Food Quality, Product Information
	Local Economy	Value Creation, Local Procurement
Social Well-Being	Decent Livelihood	Quality of Life, Capacity Development, Fair access to means of production
	Fair Trading Practices	Responsible Buyers, Rights of Suppliers
	Labor Rights	Employment Relations, Forced Labors, Child Labor, Freedom of Association and Right to Bargaining
	Equity	Non-Discrimination, Gender Equality
	Human Safety and Health	Workplace Safety and Health Provisions, Public Health
	Cultural Diversity	Indigenous Knowledge, Food Sovereignty

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Table 3. List of excluded SAFA themes

Excluded Themes	Grounds for Exclusion
E1. Atmosphere.	- No available data on air quality
E3. Land	- No available data on soil quality

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Reporting

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Good Governance

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Good governance is the process of making and implementing decisions in the three pillars of sustainability – environment, social responsibility and the economy. Sustainability will remain a mirage unless effective governance is taken seriously. This theme includes five aspects which are Corporate Ethics, Accountability, Participation, Rule of Law, and Holistic Management. SAFA's governance dimension is based on a notion of Good Corporate Governance that specifically considers all affected stakeholders.

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G1-Corporate Ethics. This theme includes two sub-themes which are the Mission Statement and Due Diligence. In SAFA, corporate ethics refers to the sustainability principle being woven into the fabric of the entire organization. It entails developing a statement that goes beyond profit to embrace sustainability and is based on a vision of the future that appeals to all stakeholders. This is the foundation of a successful, long-term, and integrity-driven business culture. Small-scale producers may have strong and unambiguous missions based on firmly held values and as members of a shared values group. Due diligence methods can help foresee and prevent harmful environmental and human repercussions, protecting the enterprise's reputation. The SAFA governance structure aims are important because they promote contemplation on values and principles.

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Mission Statement. The Mission Statement is the highest level of governance and should express a commitment to sustainability. To be mission-driven, the business must demonstrate that the mission is reflected in enterprise codes and policies, and the governing body must demonstrate the mission's influence on informing and shaping policy and practice. For 2018-2022, the Calamba Fisherfolks Producers Cooperative had a clear vision and mission. Their vision states that “*Sa taong 2022, and CFPC ay isa sa pangunahing kooperatiba ng mga mangingisda na nagbibigay ng produkto at serbisyong pangpangisdaan sa Lalawigan ng Laguna* (By the year 2022, CFPC is one of the main fishermen's cooperatives providing fishery products and services in Laguna Province). On the other hand, their mission statement stated that they aim to *maitaas ang antas ng pamumuhay ng bawat mangingisdang kasapi* (uplift the living conditions of the members of their cooperative), *makapagbigay ng dekalidad na produkto at sebisyon pangpangisdaan sa mga kasapi at mamimili* (produce a quality product and service to their fellow fisherfolks and consumers), and *maging kabahagi sa pangangalaga at pagpapaunlad ng Lawa ng Laguna katuwang ang pamahalaan, komunidad at iba pang ahensya* (to be part of the effort to protect and develop the Laguna Lake in collaboration with the government, community, and other agencies). Their mission statement addresses each of the pillars of sustainability being the first mission as economical, second is social and the third one is environmental. While it was not clearly stated on the data whether each member was able to explain their mission and how it influences the work they do, the members' activities revolve around this mission, especially with the services that the cooperative provide for its members and to the community. Thus, there is an articulated mission of the cooperative as stated in their currently followed strategic map that is reflected with their activities and operations as stated in their by-laws.

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Due Diligence. In terms of risk assessment, the cooperative does not have supporting documentation or evidence that a clear policy or impact assessment tools exist. The cooperative's decision-making process is built on these essential components. Furthermore, no documentation exists that would demonstrate consistent losses brought on by unavoidable risks.

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G2-Accountability. Accountability in SAFA refers to the disclosure of reliable data regarding strategy, goals, and performance to people who base their actions and decisions on this information. Sub-themes include holistic audits, responsibility, and transparency. The credibility, openness, and performance of an enterprise can have an impact on its success.

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Holistic Audits. All aspects of sustainability in the SAFA dimensions that are relevant to the organization are monitored internally and, if possible, examined in accordance with established sustainability reporting standards. Genuine sustainability auditing demonstrates the incorporation of sustainability values into organizational governance and culture. Many larger enterprises have developed and adopted institutionalized sustainability reporting and auditing tools, whereas smaller enterprises and those just starting out on their sustainability journey may find less prescriptive approaches, such as Social Auditing, more accessible because they can make efficient use of all of the organization's existing data systems.

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Given that the CFPC is composed of small-holding fisherfolks with low capital capacity, the cooperative does not have access to any internationally recognized or established framework for sustainability reporting. However, as stated in the cooperative's by-laws, the cooperative should annually perform Social Audit Report, in consultation with their Audit Committee and Accredited Social Auditor which they also submit to the Cooperative Development Authority (CDA) as part of the process of their Certificate of Compliance. This report includes its program of activities pursuant to its socio-civic goals of the cooperative. Thus, they have their own systematic approach in doing their social auditing.

Responsibility. Same with social audit, the cooperative also prepares their Performance Audit which is being prepared by their Secretary and Audit Committee who enumerates in detail all their activities. This includes the copies of the semi-annual report on mediation and conciliation as received by the Authority pursuant to EO97. In addition, it is also the members' or the stakeholders' responsibility to attend general assembly which is also where their activities are being presented and what comes next to their cooperative, and an avenue for decision making which involves members' rights to vote.

Transparency. "A little sunlight is a great disinfectant," as the expression goes in sustainability circles. This relates to how much better sustainability processes and projects perform when organizations are transparent. True transparency entails recognizing stakeholders' information demands and making accurate, timely, and relevant information easily accessible.

In accordance with their by-laws, it is one of the rights and privileges of the members to "inspect and examine the books of accounts, the minutes books, the share register, and other records of the cooperative during their reasonable hours". They can also "secure copies of cooperative records/documents pertaining to the account information of the concerned member". In addition, having a transparency report has always been the first agenda of the general meetings of the cooperative and incorporating them all to their year-end report. This shows that there is transparency with the documents possessed by CFPC.

G3-Participation. Participation in SAFA refers to the necessity for outreach to and involvement of interested parties, particularly those who are materially affected. This involves being able to take an active part in decision making. The included sub-themes are Stakeholder Dialogue, Grievance procedures, and conflict resolution.

Stakeholder dialogue. Stakeholder dialogue entails identifying stakeholders and engaging in mutually satisfying and long-term engagement with these stakeholders. Effective engagement takes into account an understanding of how disparities in power can hinder vulnerable stakeholders from becoming engaged, as well as a dedication to recognizing and overcoming engagement barriers for all stakeholder groups. It is most valuable when an organization can include the perspectives of its stakeholders into its decision making. Engagement can take various forms, including new technology and social media, as well as more traditional methods such as surveys, meetings, interviews, and focus groups.

In 2022, the cooperative already had 76 members. While it is not clear whether the cooperative can identify all its members in all walks of life and social status, it is safe to assume that the cooperative has a list of its members and their background. In addition, although the members can identify stakeholders that directly affect them like buyers as they directly connect with them during marketing, not everyone can identify agencies that provide support to the cooperative, or they may just simply receive no support at all. In terms of their engagement with one another, the members of the cooperative were able to communicate through Facebook messenger and during their involvement to the cooperative's activities such as seminars, trainings, Bantay Lawa activities, clean up drives, among others. However, when asked about the observed problems within the organization, the members mentioned that not everyone participates in meetings. There is no specified action of the cooperative to address this nor any strategies to overcome this barrier. As part of the members effective participation, every member of the CFPC has the same power within the cooperative, and that is their power and right to vote, may it be for electing board of directors or even for achieving quorum for internal decision-making during meetings. However, there is no collected evidence that shows that they inform the stakeholders regarding the impact of the engagement, aside from what is stated in the by-laws where the board of directors should present the past activities, including the decision made based on votes, during their meetings.

Grievance Procedures. In their by-laws, the proper process for disqualifications on the positions in the management are clearly stated. In addition, there is a mediation and conciliation committee that would evaluate any grievances that may occur in the cooperative. In section 1 of Article X Settlement of Disputes, "All inter, and intra-cooperative disputes shall be settled within the cooperative in accordance with the pertinent Guidelines issued by the Cooperative Development Authority, Art. 137 of Republic Act No. 9520 and its Implementing Rules and Regulations, Alternative Dispute Resolution Act of 2004 and its supplementary laws. According to the respondents, there are no records yet of conflicts that reached the committee.

Conflict Resolution. Every business has real or potential disputes with its stakeholders. Conflicts can be interest disputes in which the parties' rights are in conflict and have not been resolved, or rights issues in which the parties' interests are at

294 stake have been settled, but the meaning of the rights conferred is up for debate. While conflicts are inevitable in every
295 organization, just like CFPC, at present, there is no recorded instance of conflict among members that reached their
296 mediation and conciliation committee. They were able to convey conflicts in their enterprise, which includes policy unification
297 issues, illegal fishing practices of other fisherfolks in the area which they were able to put into justice according to law as
298 part of their Bantay Lawa program.
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300 **G4-Rule of Law.** As defined by the United Nations, the Rule of Law is a governing ideal under which all persons and entities
301 are "accountable to laws that are publicly promulgated, equally enforced, and independently adjudicated." In the most basic
302 sense, it is legal conformity. The Rule of Law is viewed in a corporate perspective in SAFA, with the primary goal of protecting
303 the individual and group rights of all. Sub-themes under the Rule of Law are Legitimacy; Remedy, Restoration, and
304 Prevention; Civic Responsibility; and Resource Appropriation.
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306 **Legitimacy.** The enterprise's adherence to the rule of law will be the first criterion for operational legitimacy. Legal or
307 regulatory violations pose a huge reputational risk to organizations; hence it is critical that the organization's governing body
308 be properly informed and provides clear guidance to management. This does not imply that the organization will always
309 follow the rule of law, but that any violation must be taken seriously at the governance level and weighed against the
310 enterprise's mission and values.
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312 The cooperative has its own By-Laws and articles of cooperation which serve as the foundation of the enterprise and basis
313 for all their activities especially that it also involves policies to ensure adherence of the members. It is also the responsibility
314 of the members of the cooperative to review and observe what is written in their bylaws. However, there is no evidence
315 that the cooperative have a governance risk management strategy in operation.
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317 **Remedy, Restoration and Prevention.** The enterprises' operational legitimacy will be determined first by their commitment
318 to the rule of law and their ability to immediately correct any breach, restore or compensate the impacts of any violation,
319 and put in place means to avoid any future breach. The same regime should be applied to international human rights
320 standards as it does to less sanctioned norms such as local or national legislation and voluntary codes to which the
321 organization may subscribe or support. While the bylaws of CFPC already indicates policies, regulations and codes, what's
322 stated in the by-laws can still be amended with proper procedures indicated in the aforementioned document. However, in
323 terms of breaching any laws or policies within the enterprise, there is no evidence to ensure that their members do not
324 breach law and how they will be remedied, restored, or prevent such case again. Also, there is no record that any member
325 having breached the law and what actions the cooperative had taken. However, in terms of the moratorium and illegal fishing
326 practices in the lake, it is part of their objectives to adhere to laws in protecting the environment.
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328 **Civic Responsibility.** Enterprises in the food supply chain include both global and national corporations. To achieve
329 excellence in this sub-theme, enterprises must demonstrate that they utilize their influence responsibly and on behalf of the
330 least powerful stakeholders and those who cannot assert their rights. A sustainable food supply chain will exist when all
331 components of the supply chain are free of exploitation of persons, communities, and the environment in all four aspects of
332 sustainability.
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334 There is no record that the cooperative is a member to any organization as a member that supports or involved in activities
335 which seek to influence laws, regulations, international human rights codes or voluntary codes. However, the CFPC always
336 coordinates with the government and some members are part of the FARMC which promotes sustainability of the
337 environment, and so with society since they always go for improvement of the cooperative.
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339 **Resource Appropriation.** This goal is often achieved by ensuring that the principles of Free Prior and Informed Consent
340 (FPIC) and the Voluntary Guidelines on the Responsible Governance of Tenure are addressed. The FPIC principles were
341 created after significant consultation to safeguard communities against unethical resource exploitation and misuse. They
342 also give firms with instructions on how to deal fairly with communities and some kind of reputation protection. The capacity
343 of an impacted community to be informed is critical to the proper operation of FPIC. This comprises information supply,
344 independent guidance, and the ability to self-organize for the purpose of representation. Tenure regulations govern who
345 has access to which resources, for how long, and under what restrictions.
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347 For resource appropriation, the cooperative did community mapping and the members are aware of the assets of the
348 cooperative such as fish landing facility, as well as the law regarding what area they only have access to. The cooperative
349 relies heavily on the resources that Laguna Lake can provide and during the survey, no one had answered that they have
350 any issue with tenure rights or if they even do tenure in their production. They adhere to the moratorium in relation to the
351 Laguna Lake and the policies on the appropriate activities that can be conducted there.
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353 **G5-Holistic Management.** In SAFA, holistic management is defined as management that aspires to continuously enhance
354 environmental integrity, economic resilience, social well-being, and good governance. The ultimate objective of operations

is to be fully aligned with societal growth that is sustainable. Sustainability Management Plan and Full-Cost Accounting are two sub-themes covered.

Sustainability Management Plan. A sustainability plan for an organization is created that takes a comprehensive perspective of sustainability and considers synergies and trade-offs between components, including the environmental, economic, social, and governance elements. As mentioned earlier, the cooperative's mission for the year 2022 revolves around the pillars of sustainability. However, there is no collected document that will show the comprehensive plan that would demonstrate the progress of this mission and its outcome. They do not have any written business plan or sustainability management plan in which the cooperative realizes to focus on in the future.

Full-Cost Accounting. The enterprise's business success is measured and reported while considering direct and indirect effects on the economy, society, and physical environment (e.g., triple bottom line reporting), and the accounting process makes transparent both direct and indirect subsidies received, as well as direct and indirect costs externalized. The cooperative uses a financial software that would account all their financial transactions. It is also complete with the different financial statements of their operations. The bulk of their cost of sales predominantly consists of expenses related to producing their products, encompassing both the cost of goods sold and administrative expenditures. Additionally, the majority of their cash inflows are attributable to donations and grants they have received, highlighting the critical role that outside funding sources play in sustaining their financial stability.

Environmental Integrity

As human activities approach tipping points or cross planetary boundaries (Rockstrom et al, 2009), maintaining the integrity of the Earth's system is a must for any growth. Environmental integrity entails preserving life support systems necessary for human survival by reducing negative environmental consequences and encouraging positive ones. The following environmental sustainability themes are covered in a SAFA: Atmosphere, Water, Land, Materials and Energy, Biodiversity, and Animal Welfare.

E2 – Water. In any site where it operates, this goal seeks to guarantee that an enterprise does not exacerbate issues related to ecosystems' water supply or human water users' problems with it.

Water Withdrawal. Due to the cooperative's small-scale operations, there is no clearly stated target for reducing water consumption in the CFPC documents. Fisherfolks within the cooperative primarily rely on water from the Laguna Lake, which is already considered poor in terms of condition and quality for their operational needs due to the proliferation of algal bloom. Additionally, there is a lack of recorded data on the cooperative's withdrawals of ground and surface water.

Water Quality. As the fisherfolk depend on water from Laguna Lake, the cooperative is actively engaged in activities aimed at safeguarding these waters, aligning with their mission. Although specific clean water targets or measures are not explicitly outlined, the cooperative has undertaken steps in that direction through clean up drives, Bantay Lawa program and waste management. In terms of water pollution prevention practices, the cooperative currently does not employ wastewater treatment, nor do they utilize non-chemical methods. Unfortunately, there is a lack of available information regarding the concentration of water pollutants and the quality of wastewater, making it challenging to ascertain the percentage or share of pollutants contributed by the enterprise to the body of water.

E4 – Biodiversity. The diversity that exists in ecosystems, including the range of species present and the genetic diversity among those species, is referred to as biodiversity. Specifically, the range and variability of the plants, animals, and microorganisms necessary to preserve the agro-ecosystem's processes, structure, and functions are referred to as agricultural biodiversity. Food security is ensured and supported in large part by this diversity.

The sub-themes included are Ecosystem Diversity, Species Diversity, and Genetic Diversity. Ecosystem Diversity. Their strategic plan emphasizes their commitment to contribute to the conservation and development of Laguna Lake. Despite this, the specifics of their approach, particularly in rehabilitating the diversity of habitats within their influence, remain unspecified. This is a crucial consideration, especially given that a significant portion of the local fishing community is involved in capture fisheries. On a positive note, in terms of the land use and land cover change, collaborative efforts with supporting agencies, like BFAR, to convert a land have enabled the cooperative to successfully establish a community fish landing center.

Species Diversity. In the Laguna Lake, where the cooperative's fisherfolk cultivate their produce, there is a notable presence of an invasive species, namely the knife fish. While not directly attributed to the enterprise's activities, the extensive tilapia harvesting may have played a role in altering the ratio of tilapia to these invasive species in the lake. Conversely, those engaged in grow-out farms within the cooperative practice polyculture, cultivating a diverse range of species such as mamale, tilapia, hito, among others.

415 Genetic Diversity. The cooperative employs nets equipped with escape panels or mesh sizes that comply with legal
416 requirements, preventing the capture of small fishes. However, it's noteworthy that the fishes in Laguna de Bay are
417 characterized by inbreeding, leading to smaller sizes in the catches obtained by the cooperative.
418

419 **E5 – Materials and Energy Use.**

420 Within the context of SAFA, Materials and Energy refer to the elements that the environment provides to an economy, as
421 well as the extraction, conversion, manufacturing, and consumption of these elements as well as their ultimate return as
422 waste or residuals to the environment after being processed and used in economic activities. Materials Use, Energy Use,
423 and Waste Reduction and Disposal are some of the related sub-themes.
424

425 **Material Use.** In keeping with sustainable energy practices, the cooperative currently uses donated solar power, specifically
426 in their tilapia smoking machine. Furthermore, the cooperative makes gill nets, as one of their revenue streams, although it
427 may be crucial to consider its potential contribution to waste generation. The grow-out farmers in the cooperative actively
428 participate in recycling initiatives with regard to feed practices. They show a dedication to sustainable material use in their
429 operations by using leftover feed and incorporating chicken manure as alternative feed sources for their fish.
430

431 **Energy Use.** The cooperative is utilizing renewable energy thanks to donated solar power. It is important to note, however,
432 that there is no specific target or written plan in place for renewable energy goals of the cooperative.
433

434 **Waste Reduction and Disposal.** The fishermen properly clean the waste produced in the CFLC, especially in its production
435 area. But it's crucial to note that the community fish landing center is located near the lake and doesn't have adequate
436 roads, which makes it difficult for garbage trucks to regularly pick up waste. Moreover, there is a lack of a written plan or
437 particular documented steps intended to reduce waste, especially when making their nets. An environmentally friendly
438 practice is observed when it comes to fish processing waste, such as intestines, as these by-products are fed to janitor fish.
439

440 **E5 – Animal Welfare.**

441 Animal welfare is concerned with the general physical and psychological well-being of animals. The main way that animal
442 agriculture affects the environment is through its contribution to climate change. According to the Food and Agriculture
443 Organization (FAO), the agriculture sector contributes less than one-fifth (18%) of greenhouse gas emissions caused by
444 human activity. Sub-themes include health and freedom from stress.
445

446 **Health.** The cooperative does not use growth promoters in their feed because they value the health of their fish more than
447 anything else. In spite of this diligent work, they face substantial obstacles that lead to increased rates of disease and
448 injuries. These difficulties arise from a variety of factors, such as the existence of invasive species and the lake's subpar
449 quality.
450

451 **Freedom from stress.** Considering that most of the fisherfolks are engaged in capture fisheries, there is no record outlining
452 how they address stress levels experienced by the fishes. However, there is the Bantay Lawa initiative which prevents the
453 occurrences of illicit fishing practices in the area which may also cause stress to the aquafisheries. On the other hand, it is
454 acknowledged that high stocking densities in cages—especially in grow-out farms—observed among the fisherfolks are a
455 contributing factor to higher fish mortality rates.
456

457 **Economic Resilience**

458
459 **C1-Investment.** In SAFA, the term 'investment' is defined as putting money into something, such as capital goods, human
460 resources, or ecosystems, with the intention of profiting. Investments are assessed at the enterprise, community, and value
461 chain levels. Internal investment, community investment, long-term investment, and profitability are among the sub-themes
462 covered.
463

464 **Internal Investment.** This goal refers to an enterprise spending resources (such as time, human resources, and cash) to
465 improve the enterprise's own sustainability performance across a variety of dimensions, including governance,
466 environmental, social, and economic. Improving the enterprise's sustainability performance necessitates the commitment
467 of the governance body as well as the ability to drive appropriate change. Without effective investment allocation and
468 oversight, it is unlikely that an enterprise will make considerable progress.
469

470 While it is important to have a monitoring system to ensure sustainability performance of the cooperative on social,
471 economic, environmental and governance level, the cooperative only focuses in investing human capital aspect through
472 capacity building of its members by attending to workshops and trainings about creating gill nets, processing fish products,
473 and having educational tours that would widen their knowledge about the fishing industry aside from the production aspect.
474 In addition, they also did partnerships with different government institution including the Local Government Units and Bureau
475 of Fisheries and Aquatic Resources that would also give them opportunities for technological advancement of their

476 production, to join activities involving the protection of the Laguna Lake, as well as having facilities that would also help in
477 their operations. These practices were more focused on investing on the cooperative's members' needs and improvement.
478 However, there is not much investment in tools that would assess the impact of these practices to their sustainability
479 performance.

480
481 **Community Investment.** Investing in a community is allocating and utilizing several resources (such as time, human
482 resources, and cash) to address and contribute to the resolution of a community need(s). The micro-environment of the
483 enterprise comprises the community in which operations take place, therefore there is an organic relationship between the
484 enterprise's activities and investments and the community's long-term growth. The enterprise's operations have an impact
485 on the community, whether directly or indirectly.

486 The Facebook page managed with the help of the Municipal Agriculture Office of Calamba City features updates from CFPC
487 and Calamba Fisheries, highlighting their participation in various training sessions and initiatives aimed at enhancing
488 environmental care skills and knowledge. These efforts not only assist farmers in reducing water pollution that can
489 compromise produce quality but also contribute to fostering a cleaner community environment and preventing floods caused
490 by excessive lake garbage. Moreover, the presence of facilities like the Community Fish Landing Center and processing
491 facility plays a crucial role in improving the accessibility and convenience of fish production and marketing, ultimately
492 benefiting the community with easier access to food products.

493
494 **Long-ranging investment.** Financial sustainability is a critical pillar for ensuring the enterprise's long-term operations and
495 development. An enterprise must create business plans and allocate resources to strengthen its long-term capacity to
496 generate and increase profits. In order to stay in business and increase its potential and growth, the organization must also
497 spend for long-term solvency and profitability. To ensure a strong economic performance, financial accountability, and long-
498 term success, investments to develop its capital structure (i.e. financial, natural, physical, human, and social) as well as its
499 competitive advantage in the marketplace are essential.

500
501 Given the limited budget of the CFPC, it is difficult for them to spend for long-term investments that usually require huge
502 amount of budget. Their financial capacity only allows them to perform short-term investments such as making nets for their
503 '*pagbabaklad*' and other materials for their production and focuses more on establishing their human resources. They,
504 however, usually receive donations and grants that serve as huge investment to the cooperative that would help them
505 improve their operations and increase their profitability. In August the previous year, they also met up with the Solarset
506 Corporation, which installed solar power supply to CFLC, which is part of the project of DOST. They are also awarded land
507 and construction of the Community Fish Landing Center, from their Local Government Unit and Bureau of Fisheries and
508 Aquatic Resources (BFAR). Even the equipment/machineries in processing their smoked tilapia were also part of donations
509 and grants. These investments in having facilities and engagement in input production such as for boats and *pante* have
510 both long-term and short-term effects in their income generation. These helped them to have other means of generating
511 income aside from their harvest from fishing.

512
513 Additionally, at present, the cooperative does not have a business plan or an up-to-date document articulating revenue
514 stream, growth plan, and an operational plan that projects the generation of financial resources for the future. Although they
515 also recognize the need for it and plans to pursue such document in the future.

516
517 **Profitability.** Financial profitability is a critical foundation for ensuring the enterprise's long-term operations and growth. An
518 enterprise's net income, production costs, and the prices it sets and receives for its goods and/or services are all important
519 elements in its profitability. Trends in this over time provide insights into an enterprise's profitability.

520
521 As for the net income, although not directly stated, it was mentioned in FGD that the fisherfolks do not have stable income
522 due to unsteady volume of harvests. Most of the fisherfolks have other source of income to still earn money and sustain
523 their families. In the state of the CFPC, there is no evidence that the cooperative itself has had a consistent positive income
524 for the past 5 years that is observed to grow as the years go by. In their provided statement of operations for the year 2021
525 and 2022, it showed that the cooperative had a net loss of Php 210,954 in 2021 and gained Php 20,346 for the year 2022.
526 It is important to note that the subsidies and donations granted to the cooperative had a contribution to the incurred profit of
527 the cooperative.

528
529 The cooperative has bookkeeping software where they can input and monitor all their financial transactions. It can show
530 them their inventory, balance sheet, profits and losses, account statements and reports. However, it was not clear whether
531 they were able to do break-even points, input and calculate total production cost, the cost per unit, etc. although they have
532 an allotted item for the cost of goods sold in their statements of operations. In terms of determining the price, especially in
533 making gill nets and boats, there is an expected profit margin and the cost of production with its materials. However, the
534 same cannot be completely said in selling their fish as they mostly have low bargaining powers and not all of the produce
535 are usually sold.

C2-Vulnerability. Vulnerability refers to both human and natural systems' exposure, sensitivity, and adaptive capacity. As a result, it encompasses the level of exposure to risk (hazard, shock) and uncertainty, as well as the ability of individuals or households to prevent, manage, or cope with risk. Sub-themes covered include supply stability, market stability, liquidity, risk management, and production stability.

Stability of Production. As part of its risk management plan, an organization must minimize the negative impact of production shortages caused by economic, social, and environmental shocks, while also ensuring that production volume and quality are fulfilled. There are several tactics that can influence production stability; however, their relevance and effectiveness will differ depending on the situation. There are procedures in place to ensure that the quantity and quality of production are robust enough to survive environmental, social, and economic shocks, as well as to mitigate the risks that could jeopardize the enterprise's production process, business commitments, and quality standards.

One of the identified problems of the cooperative is the unstable volume of production due to the degrading quality of the lake water and the proliferation of invasive species. Aside from the tilapia, which is the major commodity of the fisherfolk members, a few of them also fish or culture for *mamali* or bighead. With this, the cooperative also produces nets, boats, and process smoked fish to generate income other than just relying on fish production. While they have a variety of products to avoid dependency to only one, the cooperative does not prove to conduct risk analysis to determine the level of vulnerability with the type and number of services it offers. For the inputs, most of them were grants from the government, may it be the fingerlings, or the materials used in making nets. But they also make cash payments for other fishing equipment (in the perspective of the fisherfolks) for nets, paddles, motor, boats, gasoline, ice.

The nets are usually procured by the fisherfolks within the cooperative but for the boats, gasoline and ice, they have different suppliers but most of them are sourced within Calamba only. As for those engaged in aquaculture, they buy from nearby stores for their feeds. Given that the fisherfolks belong to nearby barangays, the store they buy from can be similar, thus, there is no diversified supplier in terms of feeds. Other suppliers, especially for gill nets and boats, which they do not produce on a regular basis, are sourced either within the province (Bay) or mostly outside the province (Manila). Also, it was stated that in procuring their supplies, they first assess for the possible suppliers where prices play a huge role in choosing where they will procure. They do not have contracts with any of these suppliers, thus, they have a variety of possible suppliers and just choose which offers the cheapest. Also, they do not have a long-standing relationship with any of these suppliers that lasted for five years or so.

In selling their produce, given that the cooperative is composed of smallholding fisherfolks, there are no contracts between them and their buyer. Most of them are only selling within the community, while there are others who sell it to traders and other nearby areas, making their products somehow diversified to different buyers. Additionally, in terms of their smoked tilapia product, it is difficult for the cooperative to commit to a business relationship with possible retailers considering their low production volume of fresh tilapia as inputs. In terms of inventory, it would be seldom for them to have larger inventories than necessary especially if they were having a problem with their production volume although given the problem with the quality of their fresh produce, there are instances that some harvests are being unsold.

Based on the interviews with the fisherfolks with regards to their income and expenses, the fisherfolks continue to generate positive cash flow and income especially during peak season given that they mostly have non-cash expenses. However, during lean season, it is evident that they also incur losses, especially to those engage in capture fishery alone. However, in reference to the cooperative's statements of cash flow which only indicates their cash flow for the year 2021 and 2022, in contrast to the necessary five-year analysis, CFPC generated positive net cash flow for both years. Additionally, there is a 131.83% increase change with these net cash flows.

$$\begin{aligned} \text{Percentage Change} &= ((\text{Change in Value})/(\text{Original Value})) \times 100 \\ &= ((2,073,861-894,572)/894,572) \times 100 \\ \text{Percentage Change} &= 131.83\% \end{aligned}$$

For back-up, most members rely on the cooperative to have access to loans. On the other hand, for the fisherfolks, they either get their loans through banks, micro-financing institutions or to their relatives. The CFPC, as an organization, on the other hand, does not have liabilities for the year 2022, unlike the year 2021 with 96,567 amounts of liabilities, according to their statement of cash flows. While it was not directly stated where they get their loans, they often receive donations and grants which keeps their cash flow positive, as stated by one of the members of their Board of Directors. For risk management, the cooperative was able to identify the threats that could affect their enterprise may it be internal or external, and even propose solutions to it through benchmarking and training, with the help of the local government.

C3-Product Quality and Information. ISO defines product quality as "the totality of a product's features and characteristics that bear on its ability to satisfy stated or implied needs." Everyone has the right to expect that the things they eat, particularly food, are safe and fit for human consumption (FAO/WHO, 2003a). Similarly, producers, processors, retailers, and

598 consumers have a right to be informed by their suppliers about all aspects of a product that are relevant to its use. As value
599 chains have become more complex, so have the potential for contamination and other quality loss, as well as deception
600 about origins and quality. Food Safety, Food Quality, and Product Information are among the sub-themes covered.

601 **Food Safety.** A biological, chemical, or physical agent in food that has the potential to have an undesirable health effect is
602 referred to as a food safety hazard. Control measures, or activities that the enterprise can take to decrease the potential of
603 exposure to food hazards, or to reduce the likelihood of the risk of exposure to the hazards being realized, are included in
604 the management of food safety risks. An entity is responsible for providing a healthy and safe environment for its employees,
605 as well as preventing any health and environmental harm caused by pesticide exposure in society.

606
607 In relation to their food safety practices, the survey with the 30 fisherfolk members of the cooperative showed that they have
608 equipment or materials used for working on fishery products are made of corrosion resistant material that is easy to clean
609 and disinfect. They also ensure that as soon as they land, the fishery products are protected from contamination and free
610 from any source of heat. They also use portable water or clean freshwater in washing their harvests. All participants also
611 ensure that the products are landed as soon as possible. In addition, the laborers themselves make sure that they follow
612 proper hygiene by ensuring that their clothing and footwear are kept clean. Additionally, fisherfolks maintain the grounds
613 and environment for it to be not a source of pests and contamination, practice proper waste disposal, and ensure that the
614 water supply used in the process of manufacturing food is from a potable, and sanitary source.

615
616 As for their harvest, they (87%) practice separation of new catches from the old ones as a matter of good handling practice.
617 As for processing, the containers and utensils used by are only intended for the purpose in the processing of fish, with 97%
618 of them consistently observing this. Also, personnel that handle the fish have training on proper handling techniques.
619 Although not everyone but majority (93%) ensure that the equipment used are cleaned and sanitized on a regular basis.
620 Also, 97% of the fisherfolks only use fresh water that is free from microbiological contamination and toxic or objectionable
621 substances occurring naturally or as a result of discharge into the environment.

622
623 In terms of recording, 60% of them don't keep records of the date, fishing location or gear used and time of capture on each
624 batch of their harvest. Also, 63% of the fisherfolks do not have a sanitation supervisor who monitors the overall sanitation
625 of the plant or where the food is being manufactured.

626
627 As for the usage of any chemicals or pesticides, while it was mentioned that they maintain the grounds and environment for
628 it be not a source of pests and contamination, there is no information of how they do it and no evidence that they do not
629 completely use any pesticides or any type of chemical for the last 5 years in their production and processing operation.
630 There is no evidence that there is an existing policy extended to their suppliers with regards to the use of these chemicals
631 in the products they receive from them. In addition, the Laguna Lake, which is their main source of water for their harvests,
632 is already proven to have algae which can also bring harm to their harvests.

633
634
635
636
637 There are no records of food contamination incidents so far that can be connected to the cooperative's products. They may
638 not have the most advanced technologies or equipment in post-harvest or processing of fish, they still ensure that their
639 production area is clean to prevent any contamination incidents.

640
641 **Food Quality.** "Quality standards" refer to the group of regulations established to ensure food quality and compliance with
642 the highest nutritional requirements applicable to the type of product. Food standards are a set of laws or legislation that
643 define particular characteristics, such as composition, appearance, freshness, source, sanitation, and purity, that food must
644 meet in order to be distributed or sold. The company uses quality control techniques to verify that the product meets the
645 desired level of quality and nutritional criteria. Product quality is a critical component to exploit the enterprise's market
646 positioning and growth.

647
648 Since there is an ongoing problem regarding the proliferation of algae in the lake because of the polluted water, the produce
649 is being affected, thus, there many fisherfolks who were not able to sell their harvest as this also affects the quality (in terms
650 of taste, and smell) of the fish. There is no data on the exact percentage of the production that is affected.

651
652 **Product Information.** Product labeling is a vital component of transparent customer accountability and, finally, customers.
653 Information typically gives specifics about the content and composition of products, as well as specific aspects of the
654 product, such as its origin and manufacturing method. Labeling and claims range from nutritional, ethical (e.g. fair trade),
655 and production process (e.g. integrated production, biodynamic) characteristics to the mundane, such as whether the food
656 is genetically engineered (e.g. GMO-free) or has special consideration for wildlife (e.g. dolphin-free tuna, bird-friendly
657

658 coffee). Traceability is increasingly being ensured across all stages of the food chain, allowing items to be easily and
659 correctly recognized and, if necessary, recalled.

660
661 Given that tilapia is highly perishable, the cooperative sells them fresh from catch and are only being displayed on public
662 markets, indicating its price. The same goes with their processed products such as *tilanggit*, which are only packed in
663 plastics within their community.

664
665 There is no traceability system in place for their produce. Given that most of the fisherfolks do not even record the date,
666 location and other details regarding the batch of their harvest, each fisherfolk also has their own market for their produce
667 that may also vary from time to time. Given that they are only smallholding fisherfolks, they were not engaged with large
668 producers, distributors or marketers who are supposed to be certified, thus, they do not have records of certification of its
669 procurement, distribution or production. Although, they are certified cooperative and have receipts for its transactions within
670 the enterprise.

671
672 **Local Economy.** SAFA considers the local economy from the viewpoint of the business and the contributions to local
673 economic development made by the business. Sub-themes value creation and local procurement are included. All sectors
674 collaborate during the local economic development (LED) process to promote local business activity. According to UN
675 Habitat (2009), it is regarded as a cornerstone of sustainable development.

676
677 The cooperative is only based in Calamba City, hence, its members will only be from the same locality. This is clearly stated
678 as well in the cooperative's by-laws as only residents in Calamba who are also fisherfolks can be members of the group.
679 Additionally, in terms of other professional works such as accountant and auditor, the cooperative asks for referral from the
680 local government unit for the possible employee to hire to do the task. On the other hand, for their fiscal commitment, as a
681 smallholding cooperative, the enterprise is declared as exempted from tax as long as they comply with the necessary
682 requirements for its renewal of registration as cooperative and they declare reports to the Bureau of Internal Revenue.

683
684 There is no specified policy implemented within the cooperative that restricts them to buy materials from non-local suppliers.
685 However, given the circumstances that the fry and fingerlings in lake are coming from the government (BFAR), their inputs
686 are locally provided. However, while some of the fisherfolks source their boats and nets locally since the cooperative itself
687 also produce these products, there are also few who procure them from municipalities or provinces, like Bae, Manila,
688 Batangas and Paranaque in which prices considered to be a huge factor for the selection.

689 **Social Well-Being**

690
691 Social sustainability pertains to meeting fundamental human needs and ensuring individuals have the right and the
692 autonomy to pursue a higher quality of life. This principle applies as long as the fulfillment of these needs does not impede
693 the ability of others or future generations to do the same. In the context of SAFA, social well-being encompasses the
694 following themes: Decent Livelihood; Fair Trading Practices; Labour Rights; Equity; Human Health and Safety; and Cultural
695 Diversity.

696
697 **S1- Decent Livelihood.** Decent livelihood encompasses the skills, resources (both tangible and social), and engagements
698 necessary to sustain a way of life that satisfies fundamental requirements for maintaining a secure and respectable standard
699 of living within the community, while also affording the capacity to save for future necessities and aspirations. Sub-categories
700 encompassed are: Right to Quality of Life; Capacity Development; and Rights of Fair Access to Land and Means of
701 Production.

702
703 **Quality of Life.** Producers and workers in businesses of every size are entitled to a standard of living that allows them
704 leisure time with their families, sufficient rest from their labor, voluntary overtime, and educational opportunities for
705 themselves and their immediate families.

706
707 While a portion of the cooperative's members fall into the category of low-income earners, there are a select few who
708 possess additional sources of income, enabling them to maintain a decent standard of living that covers their daily expenses.
709 Furthermore, on average, the fisherfolks spend about 5.56 hours in lake fishing, ensuring they still have ample time for their
710 families and income-generating activities. Additionally, their shared community membership fosters effective communication
711 among them, free from judgment, and conducted in their native language.

712
713 The average monthly household income for fisherfolk was P11,087.93 (199.30 USD; 1Php=55.63). However, if they rely
714 solely on fishing for income, their average monthly earnings are only ₱7,068.75 (127.07USD), with a minimum range of
715 P2,000 to P5,000 (35.95 to 89.88USD). In 2021, the declared poverty threshold for a family of 5 in CALABARZON was
716 P12,941 (232.63USD) significantly underscoring that the income of fisherfolk falls well below this established poverty line.

719 **Capacity Development.** In order for businesses to achieve sustainability, they should create an environment that ensures
720 consistent employment, internal career progression, skill development, and professional growth opportunities for their
721 employees. When employees experience learning and advancement while perceiving a promising career trajectory, they
722 are more inclined to deliver their utmost efforts and actively contribute to enhancing the enterprise.
723

724 Cooperative members are provided with opportunities to participate in various seminars and training programs aimed at
725 enhancing their competencies and expertise in fisheries, as well as other areas that can enhance their performance and
726 productivity within the cooperative. On average, each member has attended approximately three seminars or training
727 courses. Additionally, there is a proactive effort to encourage younger generations within the cooperative's membership to
728 partake in these events and engage in cooperative activities to spark interest in such endeavors. Also, as stated in their by-
729 laws, as long as the member has 2 or more years of experience as a member in the cooperative, they can also be nominated
730 to be part of the officers or board of directors.
731

732 **Fair Access to Means of Production.** The access rights of primary producers to essential means of production are pivotal
733 for their capacity to establish a satisfactory standard of living for both themselves and their families. These means of
734 production encompass the knowledge, tools, and infrastructure necessary for producers to achieve the production levels
735 required to sustain a decent livelihood and meet the expenses associated with production, including providing fair wages to
736 their workers.
737

738 There is no recorded discrimination in terms of access to any capacity building among members. The fisherfolks
739 continuously receive different training and seminars that would help improve their farming practices and give them ideas of
740 the opportunities they can venture on to improve their enterprise. There are also different grants from the government,
741 allowing them to have access to these training courses and even to equipment used for processing.
742

743 **S2 - Fair Trading Practices.** Within SAFA, Fair Trading Practices encompass a range of legal and human rights that grant
744 farmers, pastoralists, fishers, artisans, and other primary producers the ability to enter markets where equitable pricing is
745 determined, stability is upheld, costs are accurately accounted for, and agreements extend over the long term. These
746 agreements, whether documented or verbal, also incorporate a mechanism for resolving disputes without fear of retaliation,
747 and this process is mutually agreed upon. Subthemes included are: Responsible Buyers; and Suppliers' Freedom of
748 Association and Right to Collective Bargaining.
749

750 **Responsible Buyers.** In order to maintain enduring trade partnerships, purchasers should compensate primary producers
751 in a manner that accurately reflects the total expenses involved in maintaining a regenerative ecological system. This
752 practice also upholds the provision of a fair income, ensuring a decent livelihood for primary producers, their families, and
753 laborers, while also covering the producer's operational expenses.

754 In selling their fish produce, while more than half of the producers (64%) said that it was them who dictates the price of their
755 produce, there is still a significant number who said otherwise, where it was the buyer who decides the pricing which also
756 reflects to their low bargaining power. In addition, produce is usually sold only within the community with the help of their
757 relatives, while some fisherfolks have different buyers of their products that were usually under consignment agreement.
758

759 **Rights of Suppliers.** The rights of suppliers, especially primary producers, to engage in collective bargaining and freedom
760 of association are fundamental liberties that serve as the essential foundation and prerequisite conditions for establishing
761 equitable trade relationships with buyers.
762

763 In addition to this, there is no available information regarding the relationship of the buyers to the suppliers and how the
764 negotiation takes place but for the suppliers or the producers, they claim that they have a high level of trust and influence
765 on the buyers or traders. Additionally, 63% can name their buyers who consistently trade for their produce.
766

767 **S3 - Labour Rights.** Labor Rights encompass a set of legal entitlements and asserted human rights concerning the
768 interactions between employees and their employers, typically established within the framework of labor and employment
769 laws. Subcategories within this theme involve Employment Relations; Forced Labour; Child Labour and Employees'
770 Freedom of Association and Right to Bargaining.
771

772 Based on the bylaws of the cooperative, the fisherfolks who are willing to be part of the cooperative have to undergo the
773 required procedures to be a member, including being on legal age, in which also comes with benefits once approved. In the
774 perspective of the fisherfolks, to those who hire additional labor, they only employ family members who are usually their
775 spouses who can do the farming practices or if not, they are professional farmers who are willing to work. In addition to this,
776 these small-scale fisherfolks have the freedom to sell their own produce to their desired buyer, which are mostly located
777 within their community.
778

779 **S4 - Equity.** Equity pertains to the extent of impartiality and inclusivity in the distribution of resources, provision of
780 opportunities, and decision-making processes. Subcategories within this theme encompass Non-discrimination; Gender
781 Equality; and Support to Vulnerable People.

782
783 While there is no specific provision regarding the prohibition of discrimination within the cooperative, there is also no
784 evidence of occurrence of any discrimination among the workforces. In addition, there is no clear policy that would limit the
785 ability of the fisherfolk to work that would concern all the indicators which include race, gender, age, political activity,
786 disability, marital status, sexual orientation in all aspect of the hiring and job process. Given the proportion or number of
787 members in the cooperative, it is evident that there is a fair share of number of female fisherfolk to the male fisherfolk. This
788 clearly shows that anyone in any gender can join the cooperative. Additionally, there is no evidence that would show that
789 there is discrimination based on age, disabilities as all of them have equal rights to join the activities and programs offered
790 by the cooperative. In fact, on average, the members of the cooperative are 50 years of age with 69 as the oldest one. On
791 the other hand, the enterprise does not have any activities that would provide resources to local community to support
792 vulnerable people.

793
794 **S5 - Human Safety and Health.** The significance of ensuring occupational safety and health cannot be overstated, as it
795 profoundly impacts the social sustainability of workforce interactions, businesses of all sizes ranging from small farms to
796 large factories or plantations, and national economies. There is mounting evidence indicating that enhancing healthcare,
797 combatting diseases, and extending life expectancy are all crucial factors in bolstering economic growth and securing long-
798 term prosperity in business ventures. Subthemes incorporated are Workplace Safety and Health Provisions for Employees,
799 as well as Public Health.

800
801 Given that the cooperative is also using equipment especially for processing smoked and dried tilapia, they also underwent
802 hazard training to ensure safety of the fisherfolks, although it was not specified whether all members were able to attend to
803 the said training. In terms of their workplace, it can be concluded that the facilities like fish landing and processing areas
804 are ensured clean and safe. In addition, they conduct clean up drives to minimize the garbage in the lake. On the other
805 hand, given that they are small holding cooperative, it would be beyond their capacity to provide such health coverage and
806 medical care.

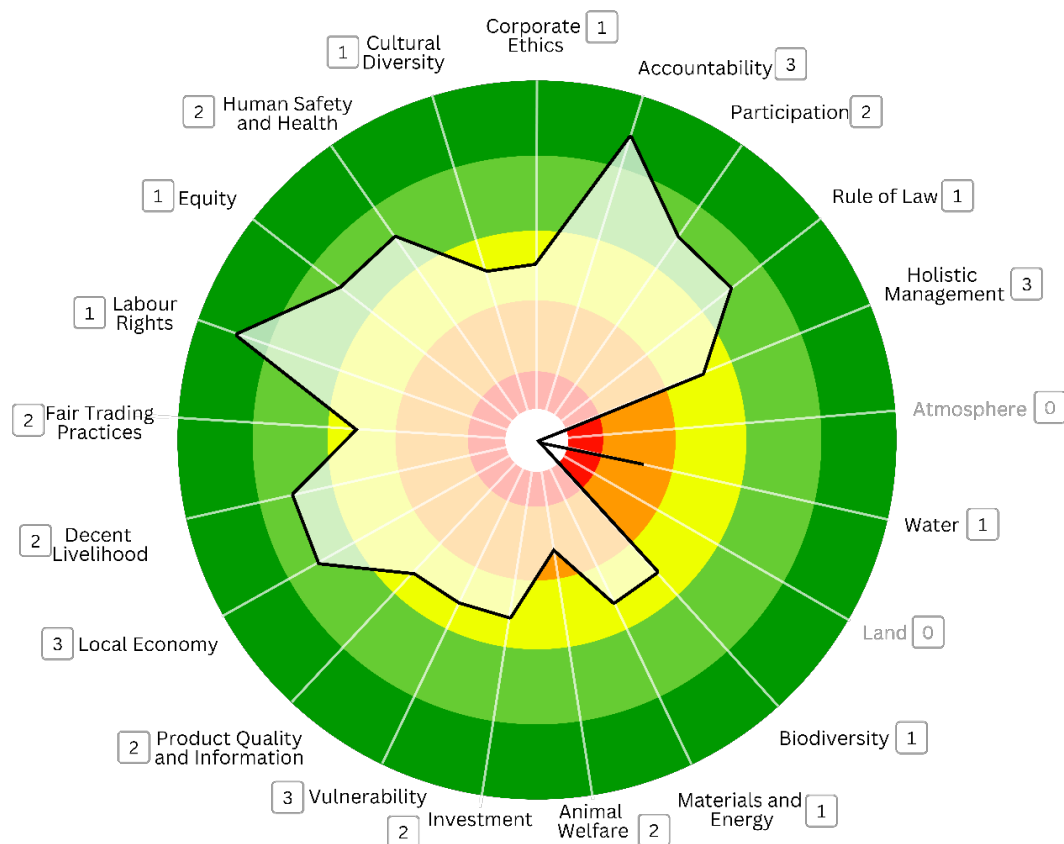
807
808 The cooperative took measures to avoid polluting or contaminating the local community and contribute to the health of the
809 local community. This reflected in one of the missions of the cooperative which is to protect Laguna Lake. Part of its program
810 is the Bantay Lawa where they protect the Lake from further pollution by taking out its trash and to arrest those who do
811 illegal activities in the lake.

812
813 **S6 - Cultural Diversity.** Cultural identity encompasses aspects like ethnicity, language, and religion, while cultural diversity
814 pertains to the countless variations that emerge as a result of cultural assimilation, encompassing but not restricted to
815 factors such as age, sexual orientation, economic standing, spiritual faith, and political alignment. Sub-themes included are:
816 Indigenous Knowledge; and Food Sovereignty.

817
818 There is no information that would show their written policies that would address the recognition and respect to the universal
819 rights of indigenous communities to protect their knowledge but given that the members are just among those in the same
820 area, same language are being spoken among them, ensuring that the indigenous knowledge is being preserved. In
821 addition, there was no records that there are members that belong to indigenous communities.

822
823 Most of the fisherfolks are relying on capture fisheries in Laguna Lake where they do not have control in the breeds that
824 they would harvest as they also rely on the seeds that the government, specifically BFAR, provide on the lake. Thus, there
825 is a limited varieties in the lake that are mostly traditional breeds. For those who engage in aquaculture and can choose the
826 variety they would produce, they go for *Tunay* and *nilotica* varieties.

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828 Using the SAFA tool, the polygraph below (Figure 2) was generated illustrating and summarizing the results and ratings of
829 each theme. This shows the overall performance of the cooperative towards sustainability and even the accuracy scores of
830 the data used.



832
833 **Figure 2. SAFA polygraph results**

834
835 Table 4 provides a thorough summary of the detailed overview of the highlights and potential issues found in the Calamba
836 Fisherfolks Producers Cooperative's sustainable practices, as evaluated by the SAFA frameworks for each theme. In
837 addition to highlighting the cooperative's admirable efforts to contribute to the overall sustainability of its operations, this
838 summary throws light on certain areas that require targeted attention and calls for improvements in order to enhance their
839 overall sustainability performance.
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Table 4. Highpoints and Hotspots of CFPC based on SAFA

Themes	Highpoints	Hotspots
Corporate Governance	<ul style="list-style-type: none"> - The mission of the cooperative is reflected to the activities and practices of the cooperative. - Follows legal laws - Transparency 	<ul style="list-style-type: none"> - Lack of tools for impact Assessment for decision making or evaluations of performance. - Lack of members' participation in meetings
Environmental Integrity	<ul style="list-style-type: none"> - Efforts to clean the water of the lake - Usage of renewable energy - Beneficial Land Conversion 	<ul style="list-style-type: none"> - No recorded practice of safe surface water withdrawals - Degrading water quality
Economic Resilience	<ul style="list-style-type: none"> - Have financial software for easy assessment of financial reports - Provide variety of products and services 	<ul style="list-style-type: none"> - Product quality are affected by degraded water in the lake - Lack of Risk Analysis
Social Well-being	<ul style="list-style-type: none"> - Some members have access to trainings and seminars to improve skills and knowledge on fishery - No record of discrimination - Partners with local suppliers 	<ul style="list-style-type: none"> - Not all members are earning enough income

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4. CONCLUSION

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After assessing the sustainability practices of the cooperative, both highlights and areas for improvement were considered in formulating recommendations to enhance the cooperative's sustainability performance.

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Development of Written Plans and Specific Targets. Plans that are well-defined and have clear objectives are necessary to direct the cooperative's operations. This entails laying out specific plans, deadlines, and quantifiable objectives, with a focus on all indicators and subthemes for the overall sustainability of the enterprise. This could be incorporated in crafting the updated strategic plan of the cooperative.

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Utilization of Effective Microorganisms (EM)/ probiotics in Laguna de Bay. The ecological balance of Laguna de Bay can be enhanced by incorporating effective microorganisms into its management practices. This strategy can promote a healthier habitat for aquatic life and improve the quality of the water.

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Establishment of Fish Hatchery. Establishing a hatchery can be very helpful to the cooperative's fish production endeavors. While it can serve as an additional revenue stream to the cooperative, providing job opportunities to its members, this would support sustainable fish farming methods as well as the preservation of aquatic resources in the area. This would also help strengthen the supply chain in the area as they would be the primary supplier of quality fingerlings among the fisherfolks.

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Diversification of Products. The cooperative's revenue streams can be diversified by exploring and expanding into the trading of processed fish products and by-products. This increases economic resilience while guaranteeing effective use of resources that have been harvested, and of their by-products to reduce waste.

887 **Capacity Building for Member Fisherfolks.** Increasing the member fishermen's capacity is crucial for enhancing
888 production activities, especially when it comes to their business operations and cooperative management. Programs for
889 education and training can provide members with the abilities and information they need to increase their contributions to

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921 **ETHICAL APPROVAL (WHERE EVER APPLICABLE)**

922

923 Conceptualization of this paper was initiated during the pandemic, between 2020-2021. Its implementation occurred
924 between 2022-2023. Hence, ethics approval is unavailable. However, rest assured that the research team went through
925 trainings and proper protocol for the project implementation.

926

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