SUSTAINABLE *BALOKO* INDUSTRY IN SORSOGON: A POLICY FORMULATION USING FUTURES THINKING APPROACH

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ABSTRACT
This paper analyzed the causes leading to the decline of Pen Shell (Atrina pectina) production in Sorsogon using Futures Thinking Foresight tools such as causal layered analysis. Likewise, using scenario development, this paper identified alternative futures for the Baloko industry in Sorsogon. Backcasting was also utilized to formulate policies and programs towards attaining this desired future. From these alternatives, an ideal future was selected and pursued. Using an exploratory qualitative method, this study purposively interviewed three informants who were directly connected with the Baloko industry in the province. Based on the causal layered analysis, results indicated that the province and its people are losing hope for its future sustainability due to sociocultural, technological, economic, ecological/environmental, and political issues. Also, based on the scenario development and backcasting results showed that using the top two drivers in this scenario development stage, four scenarios were identified by the year 2040. Hence, the paper recommended the proposed policy for the establishment of a Provincial Center for Baloko Production by 2040. The center shall be housed at Sorsogon State University. This center aims to lead the path to an idealized future by 2040 where the Baloko industry is fully sustainable.

KEYWORDS
Sustainability; Baloko/Pen Shell Industry; Sorsogon; Policy Formulation; Futures Thinking

INTRODUCTION

Sorsogon is a province in the Bicol Region, Philippines is known for its *Baluko* (see Figure 1), also known as *Pen* Shell (*Atrina pectinata*) which is just approximately 14 km from Sorsogon State University (SorSU). Baluko is a delightful seafood delicacy that resembles a hybrid of scallops and mussels with thin and dully colored shells, flexible and equivalve (Mikkelsen & Bieler, 2008). A taste of Sorsogon's coastal culture and traditions is wrapped in its flavorful tastes which can be cooked in various ways (could be with coconut milk and chili, fried, or adobo style.).

Baloko (see Figures 2 & 3) is one of the shellfish available in the province which provides a large portion of income for the marginal fishers in coastal areas. Aside from green mussels or *tahong* and oysters or *talaba* which also serve as the main source of income for marginalized people in Sorsogon Bay, *Baloko* became an additional source of income for local people especially when red tide occurred from 2006 to 2009 (Amano & Mojados, 2018). Five years ago, the price of *baloko* ranged only from 40 to 60 pesos per kilo. But today, its price range is a minimum of 200 pesos per kilo (personal communication, May 11, 2024). This price increase of *baloko* indicates its high demand in the market which is why fishermen or the *parabuso* used compressors to easily gather *baloko*. As indicated in the *Sorsogon Sanguaniang Panglungsod* in the Resolution No. 1163 Series of 2005, Sec. 20 which stipulates that the use of air compressors, self-contained underwater breathing devise shall be unlawful except for the construction, operation, and maintenance of licensed fish corals, fish pens, fish cages, mussel/oyster farms, pearl farms, and in the fishery or aquatic research by legitimate institution (see also Amano & Mojados, 2018, p. 24). While there is a policy against the use of air compressors, fisherfolks are still using them for their safety and security (personal communication, May 11, 2024). Another issue of the price increase of *Baloko* is due to the 'zoning being implemented by the province. Zoning means the fisherfolks have a specific area where they can harvest *baloko*. For instance, fishermen in *Bulabog* cannot anymore go to the Juban or Casiguran area to harvest or else the *bantay dagat* will apprehend them (Personal Communication, May 11, 2024).

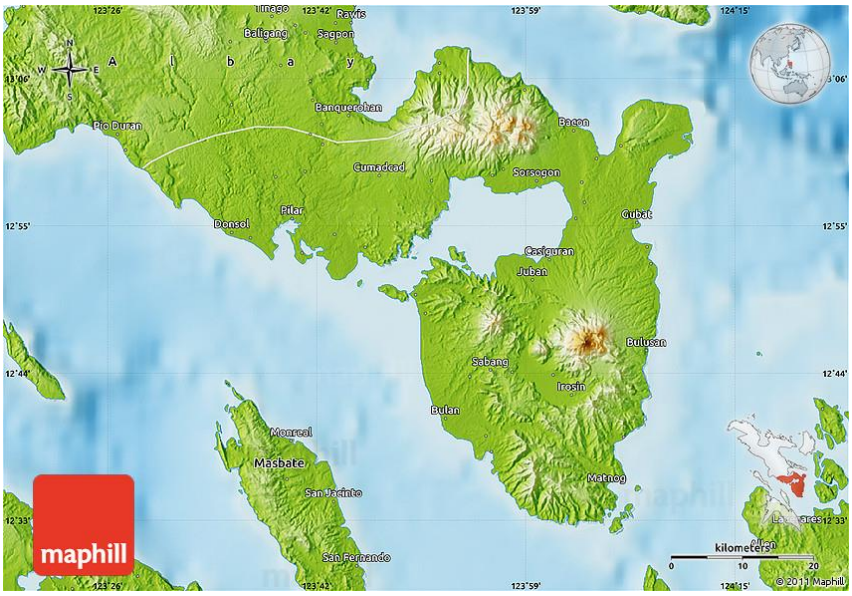

Figure 1. A map of Sorosogn Bay, Sorosogon City. This figure shows the general locations of Baloko. From the map of Sorsogon Bay - Search Images (bing.com)

Meanwhile, the Bureau of Fisheries and Aquatic Resources (BFAR) created a road map titled 'Philippine Shellfish Industry Roadmap 2021-2025 focuses more on Philippines shellfish such as mussel (*tahong*) and oyster (*talaba*). BFAR emphasized that the road map is the hinge to increase the production of these shellfish focusing on moving away from traditional cultural practices to increase production through optimization of farming efforts and advanced technologies. BFAR specifically points out issues in the shellfish industry in the Philippines. These issues are being confronted by the shellfish sector such as siltation and pollution, red tide or harmful Algal Bloom (HAB), inadequate funding infrastructure support, land reclamation and urbanization, limited market demand and low prices for shellfishes, seed supply uncertainty, and inadequate sanitary plans in densely populated urban areas, and lack of shellfish processing program before market (BFAR, 2022).

Figures 2 & 3. Baloko Shell could span about 12 inches long and 6.5 inches wide whose meat resembles that of a hybrid scallop and mussel with tentacle-like extension (Amano & Mojados, 2018). The photos were taken along the roadside at Bulabog, Sorosogon.

While BFAR focuses on mussels and oysters, *pen* shell was not included in the road map, thus less attention is given to the latter. Further, the Local Government Unit or Sorsogon has no concrete policy also as to *pen* shells' sustainable growth of the industry to enable to contribute to the overall food production and food security of the province of course in consideration of the environment. Hence, this study utilized a future-thinking approach to address the endangerment of the *Baloko* industry for its sustainability in Sorsogon province and eventually proposed a policy to strengthen its market linkages, development of value-added products, capacity building, livelihood packages, and capacity buildings, among others.

LITERATURE REVIEW

This section discussed the industry's outlook on *Baloko* and the overview of the future thinking approach in the *Baloko* industry. These two concepts guided the

study in determining the proper analytical tools to determine the future of the *Baloko* industry in Sorsogon province.

Baloko: Industry outlook and its morphological compositions

Aiming to achieve sustainable growth of the shellfish industry in the Philippines to contribute to the overall production and food security, the Department of Agriculture (DA) through the Bureau of Fisheries and Aquatic Resources (BFAR) crafted the Philippine Shellfish Industry Roadmap 2021-2025 with Dr Dennis Tanay as the BFAR Focal Person. This roadmap captured the idealistic perspective as Dr. Willian Dar, DA Secretary says that this 'will help improve the lives of shellfish fisherfolk and develop a shellfish industry that is robust, resilient, and globally competitive' (in BFAR, 2023, p. xiv). While *tahong* and *talaba* are included in this roadmap, *baloko* which is also a commodity that can be found in northern Iloilo (Jela et al., 2024) and Sorsogon (Amano & Mojados, 2018) were not incorporated. Since it is outnumbered in terms of production in the country, compared to *tahong* and *talaba*, hence, less attention is given to the latter.

Looking closely at the study of Amano and Mojados (2018), their study focused on the assessment of the existing value chains of pen shells in Sorsogon Bay and identified areas for improvement. Using tracer methodology, the value chain maps revealed that both meat and semi-processed value chains with distinct marketing practices. Actors in the value chains include fisherfolks, processors, traders, and exporters. Results also showed that there was an uneven distribution of value-added exits, with processors capturing more value than fisherfolks. Hence, the study recommended areas for improvement which included supply, pollution effects, market information, product quality preservation, industry association, and basic research on pen shells under Sorsogon Bay condition. The recommendation of this study is the shed light on this present study focusing on the sustainability of the *Baloko* industry in the province.

Another study conducted by Jela et al. (2024) focuses on the morphological characteristics of pen shells collected in northern Iloilo, Philippines. Based on the analysis of the eleven species of pen shells, they showed that there was a high correlation observed between adductor muscle properties and different shell length characteristics for five dominant species, suggesting that adductor muscle size correlated with shell size. Thus, the study provides relevant information for the related biological research on other pen shell species. Jela et al. study gave elucidation as to the pen shell diversity in the Philippines and

offered valuable insights for conservation and resource management which is the primary focus of the present study.

Interestingly, there were also 58 recognized living species of Pinnidae and 4 genera as indicated in the WoRMS Database. Its distribution can be seen in Figure 4 as exemplified by the blue balloons.

Figure 4. A distribution map for Pinnidae can be accessed from OBIS at Ocean Biodiversity Information System (obis.org)

Futures thinking approach in the study of Pen Shell

Considering the limited attention given to the pen shell industry in Sorsogon this study is anchored on the forward-thinking approach which involves embracing interdisciplinary methods, cutting-edge technology, and sustainable practices to understand and conserve these remarkable creatures. Thus, the use of scientific advancement in this industry together with the conservation efforts, this industry can be successful. Some of these efforts that may be considered are through genomic research, climate change resilience, ecosystem services assessment, community engagement and education, and technology innovations. Embracing these interdisciplinary approaches and collaboration will drive future progress in the pen shell industry and deepen people's understanding while promoting its conservation and sustainable management for future generations.

Framework

The framework of this study is anchored on the foresight framework. Through the art of looking ahead through environmental and horizon scanning, the futures triangle (Inayatullah (2008) also utilized by UP Governance Futures Lab (2024) guided this study. In understanding the futures triangle components (see Figure 5) which are a) identify the pulls of the future; b) recognize the pushers of the present; and c) acknowledge the weights of history. To

specifically define each component, the identification of pulls for the future are considered the trends, innovations, and aspirations that drive the people towards a desired future. These might include technological advancement, the demand for digital skills, and the aspirations for more engaging and efficient education in public administration education. To recognize the pushes of the present, these are the current drivers that are moving people towards the future. For this scenario, pushes might include the digitalization of *Baloko* vis-a-vis education and current AI capabilities. Then to acknowledge the weights of the history, these are past factors and legacies that could hinder progress. In this case, these include traditional harvesting practices, the digital divide, and budgetary constraints.

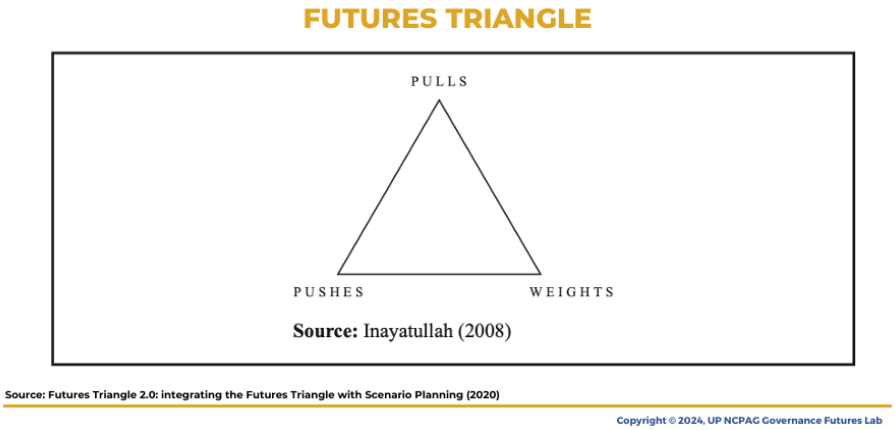

Figure 5. This Futures Triangle is adopted from the DAP-GSPDM certificate course on foresight and futures thinking batch 7 (March to May 2024)

OBJECTIVES OF THE STUDY

The objectives of the study are the following:

- Identify the causes leading to the decline of *Baloko* industry in Sorsogon
- Develop possible scenarios of the *Baloko* industry in the province using future thinking and Foresight tools
- Formulate policy towards the attainment of this desired future

MATERIALS AND METHODS

This research is an exploratory qualitative study. Exploratory research is useful in exploring substantial evidence considering limited available information

(Polonsky & Waller, 2018; Cooper & Schindler, 2006; see also Baking et. al, 2022). The goal of this exploratory research is to get a holistic perspective of an issue or situation rather than to prove a theory. This type of method has the potential to provide the researchers with rich and useful data for the study.

Participants

Using purposive sampling specifically, the referral technique (Dornyei, 2007), the researchers conducted face-to-face and online interviews with participants with direct connections with the industry. There were three interviewees whose names were just pseudonyms to conceal their identity as part of ethical consideration. Among them is Maria who was interviewed on May 3, 2024. She is one of the sellers and exporters in the province. Another is Juana who was interviewed on May 11, 2024. Juana is one of the personnel in BFAR Sorsogon. Also, Pedro was interviewed on May 11, 2024. He is a known pen shell harvester in one of the barangays in the province.

Materials

Since there were no concrete data from BFAR Sorsogon as to the level of *Baloko* production, the present study utilized the data presented by Amano and Mojados (2018). Likewise, a previous study (Jela, et al., 2024) about pen shells was also used as a reference.

Future Thinking Tools

In analyzing the vanishing *Baloko* industry in Sorsogon, the researchers used the Scenario Planning Plus (SP+) framework as shown in Figure 6. Scenario planning attempts to question the futures and at the same time creates multiple futures in the process. This is carried out by providing descriptions of future situations and identifying paths that lead into these futures (Amer, Daim, & Jetter, 2013). It is defined as the complex elements and ties them together in a coherent, systematic, comprehensive, and plausible manner (Amer et al., 2012). SP + has six elements such as 1) defining focus, 2) environmental scanning, 3) sense-making, 4) developing possible scenarios, 5) designing strategies, and 6) monitoring.

Defining focus involves defining the nature of the problem and attempting to identify the critical issue that would consequently demand the scenario planning effort. *Environmental scanning* involves the systematic analysis of the external environment. *Sense-making* assesses the problem much deeper by identifying the root causes. *Scenario development* involves the projection of

multiple futures. *Designing strategies* involves identifying alternative paths that would lead to the chosen identified future. Then, *monitoring* included the tracking of relevant indicators of implemented policy.

Figure 6. The Scenario Planning Plus framework (Ugaddan, 2022)

DATA COLLECTION AND ANALYSIS PROCEDURE

The data was collected through documentary analysis and unstructured interviews with the identified respondents of the study. Then the next step involved the conduct of environmental scanning. This framework considers the following drivers such as social, technological, economic, environmental, and political. Then a deeper assessment was done to make sense of the initial data. From this, the Casual Layered Analysis (CLA) was used as shown in Table 1.

The next step involved the development of scenarios. From the results of the STEEP framework (also reflected in the Systemic of CLA), the drivers were selected. These were the *socio-cultural* and *technological.* The positive and negative states of these drivers were defined for clarity. A *positive state* is characterized by a heightened interest of the youths to get involved in the *Baloko* industry whereas a *negative social state* is visualized as having a lack of interest by the youths in getting involved in the *Baloko* industry. Meanwhile, a *positive technological state* is described as having a highly innovative and technologically driven *Baloko* industry whereas a *negative technological state* is defined as the lack of technological innovations in the *Baloko* industry. From the intersection of these two drivers and along their positive and negative states,

four future scenarios were identified. These were: a) *Nagluluya-luyang Baloko* [Weakened *Pen* shell]; b) *magaya-gayang Baloko?* [Joyful *Pen* Shell?; c) *Akay baya*, *Baloko?* [But Why, *Pen* Shell?]; and d) *Sustiner Baloko* [Sustainable *Pen* Shell].

From the idealized future, backcasting was utilized. This method identifies the desired future and then works backward to determine the policies or programs that could connect the present to that desired future (Ugaddan, 2022). Utilizing the year 2040 as the timeline for the chosen future, milestones were identified backward (Baking, et al., 2023). Then proposed policy was crafted.

DISCUSSION

1. Causes of the decline of Baloko industry in Sorsogon

A deeper understanding of the endangered *Baloko* industry was done via Casual Layered Analysis (CLA) based on Inayatullah (2004). Table 1 illustrates the results of the CLA of the study.

Litany. At the surface, the scarcity and endangered *Baloko* in Sorsogon is tied to the lack of interest of the younger generations in harvesting as they prefer to seek white-collar jobs in cities rather than perform traditional harvesting practices of *Baloko* which could also threaten their lives. Ironically, the *pen* shell that helped them to raise their lives and finish their schooling is the same reason why these youngsters wish to leave their family traditions and practices. Education prompted them to explore jobs in the cities and careers abroad. (Pedro, personal communication, May 11, 2024). This increasing number of disinterested youngsters pursuing their parents' jobs has resulted in a decline in the number of *pen-shell* harvesters as well as an aging workforce. Without a new generation to continue their parents' legacy, this industry may be doomed to extinction. Parallel to the disinterested younger generations, the lack of advanced technology integration in the cultivation, harvesting, and post-harvesting had also led to the decline of the *Baloko* industry.

Systemic. In analyzing the problem under the systemic dimension, five drivers were considered such as socio-cultural, economic, technological, and ecological. environmental, and political. For Socio-cultural, the endangerment of the *Baloko* industry in Sorsogon is due to the lack of intrinsic motivation of the younger generations to continue the industry. This led to a decline in the number of *Baloko* harvesters. Consequently, this has resulted also in an aging workforce within the industry. As to the technological dimension, the non-integration of advanced technology within the harvesting and post-harvesting

methods of *Baloko* also affected its *competitiveness* in the market over mussels and oysters. As to the economic dimension, the decrease in the number of *pen*-shell harvesters also led to a decrease in the number of households that can generate income from the industry (Juana, personal communication, May 11, 2024). At the municipal and provincial levels, production and income related to the *Baloko* industry also weakened (BFAR personnel, personal communication, May 3, 2024). From the ecological/environmental dimension, the *Baloko* industry is likewise affected by its very source-Sorsogon Bay. Restrictions on the harvesters' places to navigate their boats to collect these *pen* shells were restricted by the imposition of zoning and the implementation of Resolution No. 1163 Series of 2005, Sec. 20. Then as to political dimension, the current actual number of *baloko* harvesters in Sorsogon is difficult to determine as some households are discouraged to register their business due to bureaucratic requirements. Business owners likewise feel that the government provides inadequate support for accessing advanced technologies and selling products to a wider market (Juana, personal communication, May 11, 2024).

Worldview. As an industry that consumes direct raw material from the ocean, the operations of the business are countered by a current worldview that seeks development through Sustainable Development Goals (SDG). Amidst the continuous heat index in the country due to climate change, environmental monitoring, the establishment of hatcheries, research development, and product development (BFAR, 2022) are among the means to achieve its goal of modernizing the province's *pen* shell industry, creating jobs and income opportunities and lifting the Sorsogon fisherfolks out of poverty. The use of advanced technology in the *Baloko* industry also a great potential for its sustainability without of course compromising its environment.

***Myth/Metaphor*.** The endangered *Baloko* industry may be explained from the stereotypical discourse that the 'center' is associated with white-collar jobs and the 'periphery' is for blue-collar jobs; that educated persons work in air-conditioned offices and not doing hard labor at home. Such ideological underpinning propels youngsters to seek jobs in the cities and leave the industry despite the economic benefits it brings to their families (personal communication, May 3, 2024). These narratives may be countered by asserting that there is more prestige attached to being an entrepreneur than being an employee; and that it is better and empowering to be an employer than to be an employee. Further, concerning the quality of *baloko* meat, it may be at par with

other seashells available in the area. Indeed, *mas sustiner na Baloko* [sustainable *pen* shell meat is superior]! Hence, the (re)cursive construction that it being an entrepreneur has higher prestige may be employed to encourage the youths to continue the legacy of their families.

Table 1: Casual layered analysis of the Baloko industry in Sorsogon province

Level	Description
Litany	Scarcity of *Baloko* Endangered *baloko* industry White-collar jobs in the cities outcompete the traditional harvesting practices Aging *pen* shell harvesters
Systemic	***Socio-cultural***: lack of interest of the younger generations to be B*aloko* harvesters ***Technological****:* Lack of sustainable, competitive, and resilient technology and practices ***Economic***: reduction of export quality Baloko meat; reduction in household income ***Ecological/Environmental*:** Difficulty in searching for an area in Sorsogon Bay where *pen* shell is commonly growing due to the implementation of zoning and due to Resolution No. 1163 Series of 2005, Sec. 20. ***Political*:** Reluctance to register sellers as a formal business due to bureaucratic requirements; Limited government support in accessing

	advanced technology and in selling the products to a wider market
Worldview	Sustainable Development Goals Environmental protection and monitoring Sustainable production, the establishment of hatcheries, research development, and product development Progress through technological innovation Preservation of socio-cultural identity
Myth/Metaphor	Centre versus periphery jobs Employment to entrepreneurship *Baloko* is superior in quality

2. ***Developing Possible scenarios for the Baloko industry in Sorsogon province***

This section presents the results of the scenario development and backcasting. Using the top two drivers in this scenario development stage, four scenarios were identified by the ear 2040. There were the a) Maluya-luyang *Baloko*, [Weakening Pen Shell]; b) Magaya-gayang, *Baloko*? [Happy Pen Shell]; c) Akay Baya, *Baloko*? [Why, Pen Shell?]; and d) Sustiner, *Baloko*! [Sustainable Pen Shell!]. Figure 7 exemplifies these scenarios.

Maluya-luyang Baloko. By 2040, at the institutional level, Sorsogon State University (SorSU) will be offering seasonal training in the *Baloko* industry. These trainings are based on the request of the clients hence no regular trainings are conducted. Likewise, this scenario is characterized by not having available equipment for the *Baloko* industry. At the local level, there is limited LGU

support as indicated by the lack of legislation institutionalizing the revitalization and sustainability of the *Baloko* industry.

Magaya-gayang, Baloko?. In this scenario, at the institutional level, SorSU is already offering regular training in the *Baloko* industry. However, there is still limited equipment for the *baloko* laboratory. Meanwhile, at the local and regional levels, the scene is characterized by limited access to advanced technology due to a lack of financial support from the LGUs.

Akay Baya, Baloko?. This scenario exemplifies that at the institutional level, SorSU is offering training and specialization in the *Baloko* industry under the Bachelor of Science in Biology, Bachelor of Science in Food Services and Management, and laboratory High School. The *Baloko* laboratory is available at this point. At the local and regional levels, there is a recognition given to acknowledge the contribution of the *Baloko* fisherfolks. However, there is less support from the LGU as seen in the lack of legislation institutionalizing the sustainability of the industry.

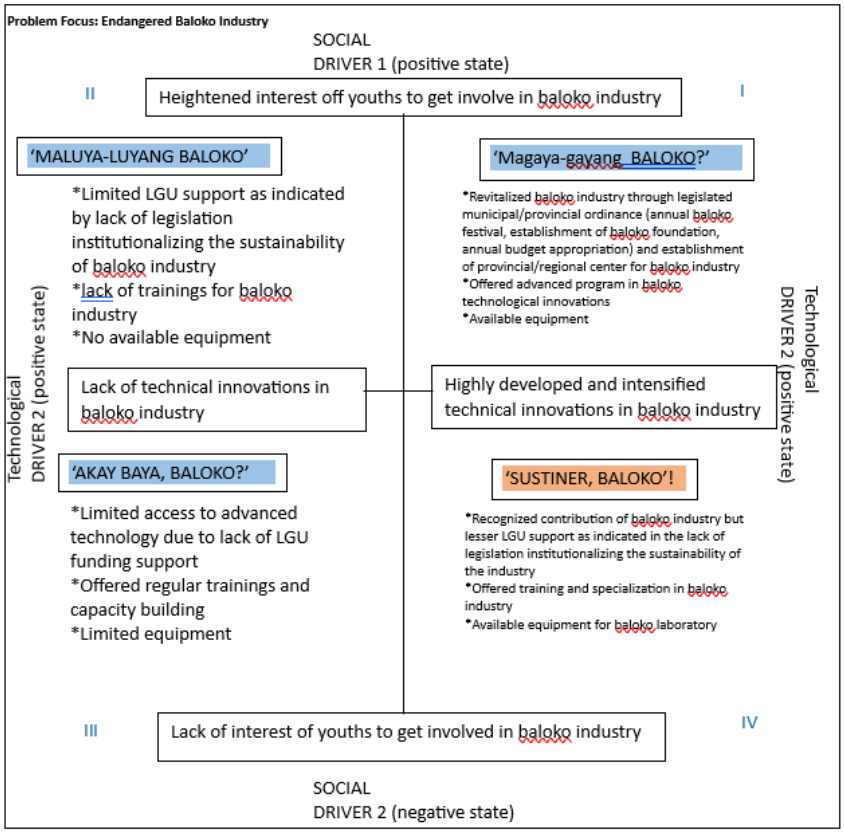

Figure 7. Results of the scenario development process using the top two drivers- social and technological.

Sustiner, Baloko!. For this scenario, SorSU is offering an advanced program in *Baloko* science and technology. At the regional level, through legislation, the regional *Baloko* Centre is established and placed at SorSU. Eventually, the strong support of the LGUs is established which paves the way for the sustainability of the *baloko* industry in Sorsogon. As such, this scenario is the idealized/desired future chosen by the researchers.

Backcasting

After determining the desired future- *Sustiner Baloko!*, backcasting was utilized to identify milestones and policies to realize the desired state as illustrated in

Figure 8. The desired future is plotted in the year 2040. Using backtracking, the study identified milestones for the years 2031 and 2035.

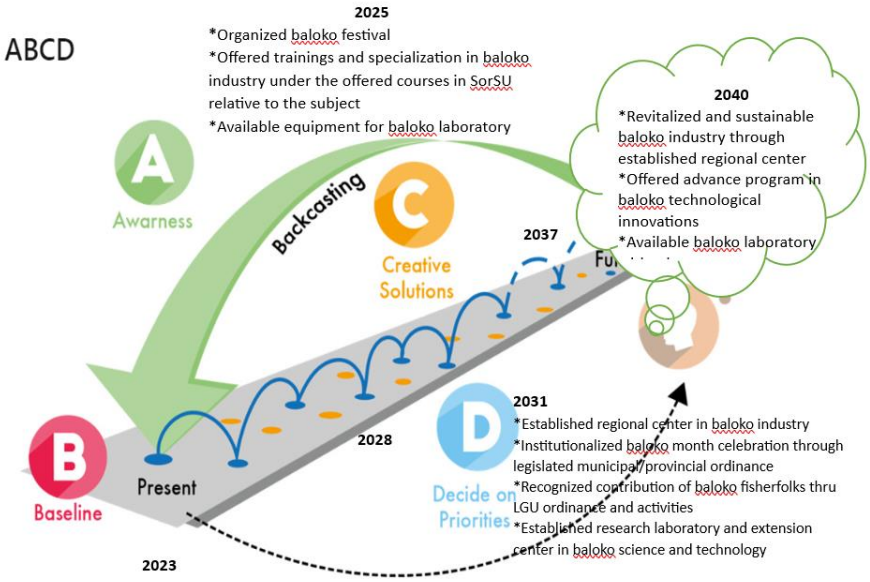

Figure 8. Using backcasting, milestones were identified for the years 2031 and 2035. Policies and programs for the year 2031 were formulated. This is a modified image of Bibri (2018).

For 2031, at the institutional level, SorSU has established a research laboratory and extension center relative to *Baloko S*cience and Technology. Meanwhile, at the local and regional level, through the LGU ordinance and activities, the contribution of the *Baloko* fisherfolks is given acknowledgment. Also, at this point, a Regional Center for *Baloko* is established at SorSU. Moreover, *Baloko* Month is institutionalized through legislated municipal or provincial ordinances.

For 2025, SorSU is offering training and specialization in *Baloko* industry under the specified program in undergraduate such as the Bachelor of Science in Biology, Bachelor of Science in Food Service and Management, and SorSU Laboratory High School. There is also available equipment for the *Baloko*

laboratory. At the local and regional levels, the *Baloko* Festival is organized but not yet institutionalized.

3. Proposed Policy Proposal for the Establishment of the Regional Baloko Center

From the milestones presented, this study zoomed in on the year 2031 wherein policy was drafted. A proposed policy for the establishment of the Provincial Center for *Baloko* is discussed in this section. This presents the draft of the proposal for the activities that address the sociocultural, technological, economic, environmental, and political issues currently experienced by the *Baloko* industry in Sorsogon.

The format of this proposal is as follows (which may depend on the format of the agency).

POLICY PROPOSAL FOR THE ESTABLISHMENT OF THE PROVINCIAL BALOKO CENTRE IN SORSOGON

I. *Background/Rationale*

Pen Shell locally known as *Baloko* has its natural habitat in Sorsogon Bay, Sorsogon Province. It is a kind of exotic food that reflects the Sorsogon's coastal culture and traditions wrapped in its flavorful tastes which can be cooked in various ways (could be with coconut milk and chili, fried, or adobo style, among others).

While *baloko* can be seen to have great potential for the economic and tourism development of the province, little attention is given by the local government to its sustainability specifically due to socio-cultural, technological, ecological, and political issues that are not properly addressed by the province. Though there is a local ordinance about zoning specifically as regards fishing and harvesting of sea shells, little attention is given to Baloko commodity as considered the main source of income of the marginalized people in Sorsogon coastal areas. Further, even the Bureau of Fisheries and Aquatic Resources (BFAR) as indicated in its road map, baloko is not on the list. This may be because it is not well-known and there may be a limited promotion of the said pen shell industry in the province (Amano & Mojado, 2018).

Thus, to promote Baloko as a viable commodity of the province and to attain its production and product sustainability, a center for Baloko is hereby proposed. The center shall promote its sustainable production through its morphological studies and product development through education and tourism

visits as well. This Provincial Baloko Center shall represent a commitment to cultural continuity, linguistic vibrancy, and community resilience. It represents Sorsogon's inspiration bridging the past, present, and future of Sorsogon's Baloko heritage.

II. Overview of the Proposed Policy

Purpose

The primary aim of the establishment of the Provincial Baloko Center is to achieve a sustainable Baloko industry in Sorsogon province to contribute to the overall food production and security of the community with consideration of ecological protection.

Specifically, the center aims to:

- Research its morphological analysis for its sustainable production and at the same time ecological preservation of the area
- Facilitate training product development with export quality
- Offer language classes, workshops, and community events, fostering linguistic revitalization. Researchers within the center can explore language practices, dialect variations, and the interplay between Baloko and other local languages
- Collaborate with Baloko practitioners, artisans, and community members to actively participate in shaping its programs and policies which align with community needs and aspirations
- Facilitate celebratory events, storytelling sessions, and festivals to celebrate Baloko culture, instilling pride and a sense of ownership
- Collaborate with other academic institutions, NGOs, and government agencies to amplify the center's impact
- Establish an effective relationship with local/domestic and international industries and centers
- Offer sustainable livelihood opportunities to the communities
- Provide educational, research, and workshops based on the needs of the community and other stakeholders

Mission Statement

The Provincial Baloko Center shall spearhead the research and extension services to different stakeholders in Sorsogon province. The center shall promote local tourism by attracting visitors to a place with unique delicacies fostering local cultures and traditions.

III. Stakeholders

Sorsogon State University

The University shall play an important role as the hub for an effective education system. It shall also take charge of the design of the proposed provincial center. It shall be the center for Baloko research development and extension services.

Local Government Unit of Sorsogon Province

The LGU Sorsogon shall govern the program organized by the municipality where the Baloko are abundantly harvested. It shall craft policies and programs for the production, protection, and promotion of Baloko in the province. Further, the LGU shall develop policies, procedures, and work instructions that are compliant with food safety standards. Also, policies as to proper harvesting in consideration of the on and off-season of Baloko so as not to deplete the sources and resources.

BFAR Sorsogon

This office shall coordinate with SOrSU and other government agencies in the province to craft policies for the production, protection, and sustainability of Baloko in the province. Specifically, BFAR shall manage and regulate areas for Baloko production through profiling and classification for prudent resource management.

Regional Offices

The Department of Trade and Industry (DTI) will be tapped for the capacity building on Baloko product development. Also, the office will collaborate to assist the beneficiaries in maximizing different marketing strategies such as online and physical marketing platforms.

The Department of Science and Technology (DOST) will collaborate with DTI and SOrSU for the conduct of training and product development. Also, the DOST will be tapped for research collaboration and funding relative to the Baloko research development.

The Department of Social Welfare and Development (DSWD) will collaborate with DTI and SorSU for capacity building and product development and shall provide training tools for the beneficiaries.

Baloko Organizations

The Baloko organization will collaborate with LGUs and SorSU in facilitating the activities such as the Baloko festival celebration, and capacity building, among others.

IV. Resource Requirements

Proposed Regional Center Building (photos of the layout of the building in 3D format will be designed by SorSU PMO) with political feasibility.

CONCLUSIONS

Amidst the perceived promising future for the *pen shell* industry in Sorsogon, the province and its people are losing hope for its future sustainability due to sociocultural, technological, economic, ecological/environmental, and political issues. Its implications are not only on the quality of living of marginalized sectors in the community but also attached to this is economic and environmental sustainability. As Pedro once said '*madali na an oras mi'* [our time is near] which resonates with the current situation of the *Baloko* industry. But this should not be happening if only this will be given particular attention. Thus, the government plays a vital role in addressing such issues. SUCs, LGUs, and legislators are the authorities and powers to collaborate and envision a brighter future for this industry. Indeed, a *sustiner Baloko* [sustainable *pen* shell] by 2040. The idealized future may be realized by proposing a policy addressing the five issues within the industry. Specifically, the establishment of the Regional Center for *Baloko* at SorSU by 2031 is considered a mechanism that would address these aforementioned drivers, thus paving the way for the attainment of the preferred future by 2040. Central to this policy is that technological innovations are co-created and commodified with the local identity and practices of its people. Thus, the support of the government through a defined budget allotment is the key to its successful implementation. SorSU plays a vital role in the sustainability of this industry.

RECOMMENDATIONS

Based on the results of the study, the following recommendations are suggested, to wit:

1) The academic institutions together with the LGUs, policymakers, and other relevant agencies related to the Baloko industry may collaborate in promoting the Baloko industry in the province and the country as a whole through policy formulation;

2) The output of this study may be evaluated and utilized to ensure policy relevance;
3) Other researchers may consider reviewing research on other shellfish industries, value chains, and policy formulations in similar contexts.

REFERENCES

Amano, V. L., & Mojados, J. V. (2018). Value chain analysis of pen shell (*Baloko*) in the province of Sorsogon, Philippines. *Bicol University R & D Journal*, *22*(3).

Baking et al., (2023). Chiseling the destiny of the woodcarving industry in Betis: A policy formulation towards revitalization and sustainability using future thinking approach. Don Horacio Ventura State University.

Bibri, S.E. (2018). Backcasting in future studies: A synthesized scholarly and planning approach to strategic, intelligent, sustainable city development. *European Journal of Futures Research*, 6(13). https://doi.org/10.1186/s40309-018-0142-z

Bureau of Fisheries and Aquatic Resources, (2022). Philippine Shellfish Industry Roadmap 2021-2025. https://www.da.gov.ph/wp-content/uploads/2023/05/Philippine-Shellfish-Industry-Roadmap.pdf

Dörnyei, Z. (2007). *Research Methods in Applied Linguistics: Quantitative, Qualitative and Mixed Methodologies.* Oxford: Oxford University Press.

Inayatullah, S. (2008). Six pillars: futures thinking for transforming. *foresight*, *10*(1), 4-21.

Inayatullah, S. (2004). The causal layered analysis reader: Theory and case studies of an integrative and transformative methodology. Tamkang University Press.

Jela, C., Monteclaro, H. M., Añasco, N. C., Quinitio, G. F., & Babaran, R. P. (2024). Identification of pen shells (Bivalvia: Ostreida: Pinnidae) collected off northern Iloilo, Philippines using their morphological characters. *Acta Ichthyologica et Piscatoria*, *54*, 49-61.

Mikkelsen, P. M., & Bieler, R. (2021). *Seashells of southern Florida: living marine mollusks of the Florida Keys and adjacent regions: bivalves*. Princeton University Press.

OBIS. Ocean Biodiversity Information System (obis.org)

Ugaddan, R. G. (2022). Foresight and Futures Thinking Tools and Methodology. Certificate Course on Foresight and Futures Thinking (CC-FFT) Batch 4. Development Academy of the Philippines.

WoRMS - World Register of Marine Species - Pinnidae Leach, 1819