

Assessing the Status of Artisanal Salt Producers in Pangasinan: Basis for a Sustainable Salt-Based Community Enterprise Framework

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Abstract

This study assessed the demographic and enterprise profiles, sustainability practices, and challenges of artisanal salt producers in Pangasinan, Philippines, as a basis for developing a Sustainable Salt-Based Community Enterprise Framework. Anchored primarily in the Triple Bottom Line Theory and supported by complementary community enterprise and sustainable livelihood frameworks, the study employed a descriptive-correlational research design involving 120 artisanal salt producers purposively selected from eight salt-producing localities. Data were collected using a researcher-developed, expert-validated questionnaire and analyzed through descriptive statistics, Spearman's rank-order correlation, and point-biserial correlation. Findings revealed that most respondents were experienced, middle-aged producers operating individually, with limited youth participation and cooperative involvement. Overall sustainability practices were moderately implemented (AWM = 3.00), with environmental sustainability (3.74) exceeding social (2.64) and economic sustainability (2.61). Significant relationships were identified between sustainability practices and selected characteristics, including age, registration status, production method, landownership, and farm classification. Social challenges were most frequently encountered (AWM = 3.50), followed by economic (3.36) and environmental challenges (2.10). Major concerns included weak cooperative organization, youth migration, seasonal income instability, market competition, and climate vulnerability. These findings informed the proposed ASIN Framework (Advancing Salt-based Industries and Networks), integrating social strengthening, economic resilience, and environmental stewardship and climate preparedness. The study supports Sustainable Development Goals 1 (No Poverty), 8 (Decent Work and Economic Growth), 11 (Sustainable Cities and Communities), 12 (Responsible Consumption and Production), and 13 (Climate Action). Its sustainability contribution lies in providing an evidence-based framework for strengthening community enterprises, preserving traditional livelihoods, improving institutional collaboration, and promoting environmentally responsible, climate-resilient salt production. Evaluation and implementation of the proposed framework are recommended.

Keywords: Artisanal Salt Production; Community Enterprise Development; Economic Sustainability; Environmental Sustainability; Pangasinan; Social Sustainability; Sustainable Livelihoods

1. Introduction

Artisanal salt production is an important traditional livelihood that supports local economies, food preservation, and cultural heritage. In Pangasinan, however, the industry faces declining competitiveness, limited financial and technological resources, workforce challenges, and environmental vulnerability. These conditions threaten the

sustainability of traditional salt-making and highlight the need for an integrated community enterprise approach. This study assessed the demographic and enterprise profiles, economic, social, and environmental sustainability practices, and challenges of artisanal salt producers in Pangasinan as a basis for developing a Sustainable Salt-Based Community Enterprise Framework.

Salt is an essential commodity for food preservation, agriculture, and industrial applications (www.ncbi.nlm.nih.gov). Artisanal salt production uses traditional methods, particularly solar evaporation and cooked-salt processing, which preserve cultural knowledge and community livelihoods (<https://ich.unesco.org>). Although historically significant to trade and economic development (www.puresalt.co.uk), traditional production has faced increasing competition following industrial modernization (www.serraprocess.com). In the Philippines, domestic salt production remains insufficient to meet demand, resulting in substantial import dependence (Montojo et al., 2024). Pangasinan, historically recognized for salt-making, remains an important producing province (www.pangasinan.gov.ph, 2023). However, unstable prices, limited financing, inadequate technology, declining workforce participation, and climate-related disruptions threaten the continuity of artisanal salt enterprises (Calvo et al., 2023; Chua, 2023; Torvikeyr et al., 2024).

Related studies identify economic, social, and environmental conditions as interconnected determinants of artisanal salt production sustainability. Economically, producers experience price instability, limited capital, insufficient technology, and competition from imported salt (Montojo et al., 2024; Taape, 2023; Calvo et al., 2023; Chua, 2023). Production efficiency is further influenced by land resources, equipment, infrastructure, and market accessibility (Fauziyah et al., 2023; Resmi et al., 2024). Socially, traditional salt-making preserves community identity and intergenerational knowledge, although workforce aging, declining youth participation, occupational hazards, and inadequate income threaten its continuity (Banicod et al. (2024); Francisco et al. (2022)). Environmentally, unpredictable rainfall, climate change, coastal degradation, and declining seawater quality affect traditional production methods (Sumi, 2024; Tran et al. (2022); Muyot et al. (2022); Ventayen et al. (2023)).

Globally, increasing salt demand presents opportunities for traditional producers, although industrial competition, high production costs, regulatory requirements, and climatic disruptions remain major challenges (Fortune Business Insights (2026); Chudy et al., 2026; Bonafide Research, 2025). Experiences in China and India further demonstrate the importance of cultural preservation, technological adaptation, and livelihood support (Zhu et al., 2024; Rajarajan & Suriya, 2026). In Southeast Asia, traditional salt industries remain economically important but experience fragmented production and import dependence (<https://trendeconomy.com>). In the Philippines, insufficient domestic production and limited institutional coordination constrain industry development (Montojo et al., 2024). The Ilocos Region, including Pangasinan, possesses favorable climatic conditions and potential production areas (dro1.depdev.gov.ph). Nevertheless, local producers continue to experience financial, technological, environmental, and market-related difficulties, underscoring the need for sustainable enterprise interventions.

The study was anchored in six complementary theories and frameworks. Ecological Systems Theory, developed by Urie Bronfenbrenner, explained how family, community, institutions, policies, and environmental conditions influence artisanal salt producers (simplypsychology.org). Socio-Economic Dependency Theory, associated with André Gunder Frank, described how unequal market relationships and resource dependence constrain small-scale enterprises (www.ncca.ie). Community-Based Enterprise Development Theory, associated with Ana María Peredo and James J. Chrisman, emphasized collective entrepreneurship, resource sharing, and community participation. Triple Bottom Line Theory, introduced by John Elkington, provided the principal basis for assessing economic, social, and environmental sustainability (<https://www.viima.com/>). The Sustainable Livelihood Framework examined producers' human, social, natural, physical, and financial resources and their capacity to withstand livelihood challenges (Chambers & Conway, 1992). Sustainable Development Theory further emphasized balancing present economic needs with long-term social and environmental well-being. The conceptual framework was supported by Republic Act No. 11985, or the Philippine Salt Industry Development Act, and Republic Act No. 9178, or the Barangay Micro Business Enterprises Act of 2002, which promote industry revitalization, enterprise development, and institutional assistance. Republic Act No. 8172, or the ASIN Law, was also considered in relation to salt iodization requirements. Using an Input-Process-Output approach, the study assessed producers' profiles, sustainability practices, and challenges to establish the basis for a Sustainable Salt-Based Community Enterprise Framework.

Previous studies examined production efficiency, livelihood vulnerability, and economic and environmental challenges among traditional salt producers (Tran et al. (2022); Fauziyah et al. (2023); Resmi et al. (2024)). Philippine studies likewise identified declining production, aging workforces, inadequate technology, limited financing, and institutional constraints (Francisco et al. (2022); Muyot et al. (2022); Ventayen et al. (2023); Montojo et al. (2024)). However, the reviewed literature provides limited integrated evidence on the economic, social, and environmental sustainability practices of artisanal salt producers specifically in Pangasinan. This study addressed the gap by examining producers' demographic and enterprise characteristics, sustainability practices,

and challenges, including relationships among the assessed variables. The findings served as the basis for proposing a locally responsive Sustainable Salt-Based Community Enterprise Framework.

The study aligned with SDG 1 (No Poverty), SDG 2 (Zero Hunger), and SDG 8 (Decent Work and Economic Growth) by addressing livelihood stability, local salt production, employment, and enterprise development. It also supported SDG 11 (Sustainable Cities and Communities) through traditional knowledge preservation; SDG 12 (Responsible Consumption and Production) through sustainable production practices; SDG 13 (Climate Action) through climate resilience; and SDG 14 (Life Below Water) through responsible coastal resource management. These goals reinforced the integration of economic viability, social inclusion, and environmental responsibility in artisanal salt production (www.un.org).

The study contributed to multidisciplinary sustainability by integrating economic, social, environmental, cultural, and institutional perspectives. Economically, it addressed enterprise viability, production efficiency, and market competitiveness. Socially, it emphasized livelihood security, community participation, and intergenerational knowledge preservation. Environmentally, it considered climate adaptation and responsible coastal resource utilization. It also highlighted the importance of institutional partnerships, appropriate technology, and supportive policies in strengthening traditional salt enterprises.

2. Material and methods

2.1 Research Design

The study utilized a descriptive-correlational research design to describe the characteristics of artisanal salt producers and examine relationships among their demographic and operational profiles, sustainability practices, and challenges. The descriptive component employed frequency, percentage, mean, and standard deviation to summarize the respondents' characteristics and sustainability conditions. The correlational component determined the strength and direction of relationships among variables without establishing causality (Bhandari, 2021; APA, 2023). The findings provided the empirical basis for formulating a sustainable salt-based community enterprise framework.

2.2 Locale of the Study

The study was conducted in eight salt-producing localities in Pangasinan: Bolinao, Bani, Anda, Dasol, Infanta, Mangaldan, San Fabian, and Alaminos City. Pangasinan covers approximately 536,818 hectares and comprises four cities and 44 municipalities (www.pangasinan.gov.ph). Salt production in these areas primarily involves solar evaporation using traditional salt beds known as banigan and cooked-salt processing. Based on May 2023 data from the Office of the Provincial Agriculturist of Pangasinan, Dasol produced approximately 24,000 metric tons annually, followed by Bolinao with 12,240 metric tons, Infanta with 9,622 metric tons, Alaminos City with 5,208 metric tons, Bani with 4,617 metric tons, and Anda with 3,750 metric tons. Mangaldan and San Fabian collectively produced 4,718 metric tons annually. The geographic distribution illustrated in the original manuscript's map identifies solar evaporation as prevalent in western coastal municipalities, cooked-salt processing in Infanta, Mangaldan, and San Fabian, and both methods in Anda.

2.3 Respondents of the Study

The respondents consisted of 120 artisanal salt producers actively engaged in traditional salt production in Pangasinan. Their demographic and enterprise characteristics included age, sex, educational attainment, years of involvement in the salt industry, registration status, production method, landownership, salt farm classification, and producer classification. These characteristics were examined in relation to economic, social, and environmental sustainability practices and challenges.

2.4 Sample and Sampling Procedure

Purposive sampling was employed to identify salt-producing localities and select eligible respondents. Participants were required to be artisanal salt producers operating within Pangasinan who voluntarily agreed to participate. Respondents were grouped according to their respective municipalities or city to ensure representation across the selected production areas. The respondent distribution in Table 1 consisted of 45 producers from Dasol, 21 from Infanta, 16 from Alaminos City, 14 from Bani, 11 from Anda, eight from Bolinao, three from Mangaldan, and two from San Fabian, totaling 120 respondents. Dasol contributed the largest number of participants, reflecting its substantial representation in the study.

2.5 Research Instrument

A researcher-developed survey questionnaire served as the primary data collection instrument. It was adapted from relevant provisions of Republic Act No. 11985, or the Philippine Salt Industry Development Act, and consisted of three parts. The first gathered demographic and enterprise information; the second assessed economic, social, and environmental sustainability practices; and the third measured the challenges encountered across the same dimensions. The indicators covered financial and market support, training, cooperative development, local

government involvement, sustainable production, and environmental protection. The instrument underwent content validation by five experts in business administration, education, agriculture, public administration, and fisheries. As described in Table 2, the validators included two academic professionals, a local government agriculture specialist, a regional agriculture official, and a Bureau of Fisheries and Aquatic Resources official. Their professional backgrounds included doctoral qualifications and extensive relevant experience. The questionnaire obtained an overall validation score of 4.46, interpreted as Very Highly Valid. The validators' identities were withheld in accordance with their consent and the Data Privacy Act of 2012.

2.6 Data Gathering Procedure

Before data collection, the researcher secured authorization from the Dean of the Graduate School and requested permission and assistance from the concerned local government units and Department of Agriculture representatives. Following approval, the researcher personally distributed the questionnaires to eligible artisanal salt producers in the selected localities. Respondents were informed of the study's purpose, procedures, voluntary participation, and right to withdraw without penalty. Submission of completed questionnaires indicated their consent to participate. The accomplished instruments were subsequently retrieved, checked, encoded, organized, and prepared for statistical analysis.

2.7 Data Analysis Techniques

Data from the 120 respondents were analyzed using descriptive and inferential statistics. Frequency counts and percentages described demographic and operational characteristics, while weighted means and average weighted means assessed economic, social, and environmental sustainability practices and challenges. The five-point Likert scale in Table 3 interpreted sustainability practices as Always Practiced (4.21–5.00), Often Practiced (3.41–4.20), Sometimes Practiced (2.61–3.40), Seldom Practiced (1.81–2.60), and Never Practiced (1.00–1.80). These categories represented very great, great, moderate, limited, and no implementation of sustainability practices, respectively. Spearman's rank-order correlation coefficient was applied to ordinal or ranked characteristics, including age, educational attainment, years in salt production, landownership, and producer classification. Point-biserial correlation was used for dichotomous variables, including sex, registration status, production method, and salt farm classification. Relationships were examined separately for economic, social, and environmental sustainability practices at the 0.05 level of significance. A p-value below 0.05 indicated a statistically significant relationship, while a p-value of 0.05 or higher indicated insufficient evidence to reject the null hypothesis. Challenges were evaluated using the five-point scale in Table 4, with interpretations of Always Encountered (4.21–5.00), Often Encountered (3.41–4.20), Sometimes Encountered (2.61–3.40), Seldom Encountered (1.81–2.60), and Never Encountered (1.00–1.80). Microsoft Excel was used for data encoding and organization, while Jamovi was employed for statistical analysis.

2.8 Ethical Considerations

The study observed informed consent, confidentiality, non-maleficence, transparency, beneficence, justice, privacy, and proper acknowledgment of intellectual contributions. Participation was voluntary, and respondents were informed of their right to withdraw without consequences. Eligible participants were selected fairly regardless of socioeconomic status, while their welfare and dignity were protected throughout the research process. To maintain confidentiality, identifying information was replaced with codes, and findings were reported in aggregate form. Data handling, storage, and disposal followed the Data Privacy Act of 2012. The researcher also maintained transparency in reporting the methodology, analysis, and findings and properly acknowledged relevant scholarly works.

3. Results and Discussion

3.1 Demographic and Enterprise Profile of Artisanal Salt Producers

3.1.1 Demographic Characteristics and Industry Experience

Most respondents were aged 45 years and above (82%), male (85%), and had secondary education (57%). The majority had considerable industry experience, particularly those with 11–20 years (39%) and 21–30 years (37%) of involvement. These findings indicate that artisanal salt production relies heavily on experienced, middle-aged producers. Although accumulated knowledge supports traditional production, limited youth participation raises concerns regarding workforce succession and the preservation of salt-making practices.

3.1.2 Enterprise and Production Characteristics

Most respondents were registered (97%), practiced solar evaporation (88%), operated as tenants of privately owned land (85%), and managed individual salt farms (99%). Large producers accounted for 57%, followed by medium producers (28%), small producers (11%), and subsistence producers (4%). The predominance of individual operations and private-land tenancy indicates limited collective organization and potential constraints on shared resources, investment, and institutional assistance. These conditions highlight the need for stronger producer organizations and enterprise development.

3.2 Extent of Sustainability Practices Among Artisanal Salt Producers

3.2.1 Economic Sustainability Practices

Economic sustainability obtained an overall weighted mean of 2.61 (Sometimes Practiced). Local market access was the strongest practice (WM = 4.75), followed by income stabilization (WM = 3.72). However, international market networking (WM = 1.00), cooperative participation (WM = 1.20), continuous production (WM = 1.34), and government incentives (WM = 1.54) were the weakest. These findings indicate that established local markets support producers' livelihoods, but limited financing, collective organization, and market diversification constrain economic sustainability. Similar challenges were identified by Resmi et al. (2024) and Montojo et al. (2024). The Philippine Salt Industry Development Act further recognizes the need for financial, technological, and market support (Republic Act No. 11985, 2024).

3.2.2 Social Sustainability Practices

Social sustainability obtained an overall weighted mean of 2.64 (Sometimes Practiced). Preservation of traditional salt-making techniques was highest (WM = 4.51), followed by gender-inclusive decision-making (WM = 3.68) and household welfare improvement (WM = 3.67). Conversely, technical knowledge utilization (WM = 1.08), training participation (WM = 1.29), workplace safety programs (WM = 1.40), and community decision-making (WM = 1.66) were limited. These findings demonstrate that artisanal salt-making preserves cultural identity and supports community livelihoods but lacks adequate institutional and capacity-building support. Plaiphum and Tansuchat (2023), Del Valle (2023), and Francisco et al. (2022) similarly emphasized the cultural importance of traditional salt production and intergenerational knowledge preservation.

3.2.3 Environmental Sustainability Practices

Environmental sustainability recorded the highest overall weighted mean of 3.74 (Often Practiced). Regulatory compliance (WM = 4.94), waste management (WM = 4.47), water conservation (WM = 4.35), and sustainable harvesting (WM = 4.32) were strongly practiced. However, climate adaptation strategies received the lowest rating (WM = 1.42). The findings suggest that producers maintain responsible routine environmental practices but remain inadequately prepared for climate-related disruptions. Ekrami et al. (2021) emphasized the importance of sustainable salt harvesting and resource protection, reinforcing the need to integrate climate adaptation into existing environmental practices.

3.2.4 Overall Sustainability Status

The overall sustainability weighted mean was 3.00 (Sometimes Practiced). Environmental sustainability ranked highest (3.74), followed by social (2.64) and economic sustainability (2.61). These results demonstrate uneven sustainability performance. Environmental management represents an existing strength, whereas economic stability, institutional support, training, and collective organization require greater attention to achieve balanced and long-term sustainability.

3.3 Relationships Between Producer Characteristics and Sustainability Practices

3.3.1 Demographic Characteristics and Sustainability

Age showed a significant positive relationship with social sustainability ($p = 0.25$, $p = 0.005$), but not with economic or environmental sustainability. Sex, educational attainment, and years of involvement showed no significant relationships with the three sustainability dimensions. The findings suggest that older producers tend to report stronger social sustainability practices, potentially reflecting accumulated knowledge and community experience. Draci and Laska (2023) similarly emphasized the contribution of older individuals to social cohesion and community development.

3.3.2 Enterprise Characteristics and Sustainability

Registration status was significantly associated with economic ($rpb = 0.28$, $p = 0.002$), social ($rpb = 0.24$, $p = 0.009$), and environmental sustainability ($rpb = 0.39$, $p < 0.001$). Production method was also significantly related to all three dimensions ($p < 0.05$). Landownership showed significant relationships with economic ($p = 0.38$, $p < 0.001$) and social sustainability ($p = 0.55$, $p < 0.001$), while salt farm classification was significantly associated with economic, social, and environmental sustainability ($p < 0.05$). Producer classification showed no significant relationships. These findings indicate that enterprise registration, production methods, land-tenure arrangements, and organizational structures are associated with sustainability practices. Matsuura et al. (2023) emphasized the importance of land-tenure security, while Banicod et al. (2024) and Montojo et al. (2024) identified organizational and institutional limitations affecting salt producers. These relationships are correlational and do not establish causation.

3.4 Challenges Encountered by Artisanal Salt Producers

3.4.1 Economic Challenges

Economic challenges obtained an overall weighted mean of 3.36 (Sometimes Encountered). Seasonal income instability (WM = 4.64), price competition (WM = 4.39), high production costs (WM = 3.99), and low market prices (WM = 3.73) were the major concerns. These findings demonstrate the economic vulnerability of artisanal

salt producers to seasonal production and market competition. Montojo et al. (2024), Ventayen et al. (2023), and Banicod et al. (2024) similarly identified financial, production, and market-related constraints affecting the Philippine salt industry.

3.4.2 Social Challenges

Social challenges received the highest overall weighted mean of 3.50 (Often Encountered). Weak cooperative organization (WM = 4.97), youth migration (WM = 4.31), low educational attainment (WM = 4.17), and limited decision-making participation (WM = 3.96) were the primary concerns. These findings indicate that weak producer organization and declining youth participation threaten community continuity and enterprise development. Banicod et al. (2024), Rideng et al. (2023), and Maflahah et al. (2024) emphasized the importance of cooperative development, while Francisco et al. (2022) and Montojo et al. (2024) highlighted challenges involving workforce continuity and traditional salt-making livelihoods.

3.4.3 Environmental Challenges

Environmental challenges obtained an overall weighted mean of 2.10 (Seldom Encountered). Climate change impacts were the most frequently encountered challenge (WM = 4.88), while biodiversity loss (WM = 2.62), land reclassification (WM = 2.58), and coastal erosion (WM = 1.88) received lower ratings. The findings indicate that climate-related disruptions remain a serious concern despite relatively favorable environmental practices. Montojo et al. (2024) similarly recognized climate variability as a major threat to Philippine salt production, emphasizing the need for adaptation and disaster preparedness.

3.4.4 Overall Challenges to Sustainability

Social challenges ranked highest (WM = 3.50), followed by economic (WM = 3.36) and environmental challenges (WM = 2.10). The overall weighted mean was 2.99 (Sometimes Encountered). These results identify weak cooperative organization, youth migration, unstable income, market competition, and climate vulnerability as major barriers to sustainable salt production. Addressing these challenges requires integrated community, enterprise, and environmental interventions.

3.5 Proposed Sustainable Salt-Based Community Enterprise Framework

3.5.1 Development of the ASIN Framework

The findings served as the basis for developing the ASIN Framework (Advancing Salt-based Industries and Networks), comprising three interconnected pillars: Social Strengthening, Economic Resilience, and Environmental Stewardship and Climate Preparedness. The framework addressed the identified weaknesses in producer organization, livelihood stability, market competitiveness, institutional support, and climate adaptation. The proposed framework integrated community participation, enterprise development, and environmental responsibility to strengthen artisanal salt production. Its structure emphasized collaboration among producers, cooperatives, government agencies, academic institutions, and market stakeholders.

3.5.2 Social, Economic, and Environmental Development Strategies

The social pillar prioritized cooperative development, youth participation, skills training, inclusive governance, and community involvement. The economic pillar focused on income stabilization, market expansion, value-added production, financial assistance, and enterprise competitiveness. The environmental pillar emphasized responsible production, coastal resource conservation, and climate adaptation. These strategies directly responded to the study's identified sustainability gaps and challenges. Integrating the three pillars provided a proposed approach for improving livelihood resilience, preserving traditional salt-making knowledge, and strengthening community-based enterprises.

3.5.3 Intended Outcomes of the ASIN Framework

The framework identified five intended outcomes: stronger communities, sustainable livelihoods, sustainable environments, stronger institutional and market networks, and inclusive growth. An accompanying action plan outlined proposed activities, timelines, resources, responsibilities, and monitoring indicators. The framework provided a practical basis for coordinated community enterprise development in Pangasinan. However, its intended outcomes remain proposed rather than empirically demonstrated, and its effectiveness would require subsequent implementation and evaluation.

4. Conclusion & Recommendations

The study revealed that artisanal salt production in Pangasinan is sustained primarily by experienced, middle-aged producers, with limited youth participation and collective organization. Overall sustainability practices were moderately implemented (AWM = 3.00), with environmental sustainability (3.74) outperforming social (2.64) and economic sustainability (2.61). Significant relationships were identified between sustainability practices and selected demographic and operational characteristics, particularly age, registration status, production method, landownership, and farm classification. Social challenges were most frequently encountered (AWM = 3.50),

followed by economic (3.36) and environmental challenges (2.10). Weak cooperative organization, youth migration, seasonal income instability, market competition, and climate change impacts emerged as major concerns. These findings highlight the need to strengthen economic and social sustainability while maintaining environmental practices and improving climate resilience.

It is recommended that artisanal salt producers, local government units, concerned agencies, and other stakeholders strengthen cooperative organizations, encourage youth participation, and preserve traditional salt-making knowledge through training and mentorship. Economic support should prioritize financial assistance, income diversification, improved market access, value-added salt production, storage, and transportation efficiency. Social interventions should enhance technical training, occupational safety, and participatory decision-making, while environmental initiatives should maintain sustainable production practices and strengthen climate adaptation and rehabilitation efforts. Support programs should consider differences in registration status, production methods, land tenure, and farm classification. Stakeholders may also review and adopt the proposed ASIN Framework as a guide for community enterprise development, while future researchers may include salt-farm workers and local government representatives and employ qualitative, mixed-methods, or longitudinal approaches.

The study was limited to 120 artisanal salt producers in selected salt-producing localities of Pangasinan, excluding other stakeholders such as salt-farm workers and local government representatives. Its descriptive-correlational design relied on survey responses and examined associations between producer characteristics and sustainability practices without establishing causal relationships. Uneven distributions across certain respondent categories also warrant caution when interpreting significant correlations. Furthermore, the study did not employ qualitative or longitudinal approaches that could provide deeper insights into producers' experiences or changes in sustainability practices over time. These limitations should be considered when interpreting and generalizing the findings.

5. Compliance with ethical standards

The author acknowledges the participation of 120 artisanal salt producers from selected salt-producing localities in Pangasinan, Philippines, and the cooperation of the concerned local government units and Department of Agriculture representatives. Prior to data collection, the researcher first secured authorization from the Dean of the Graduate School, followed by requests for permission and assistance from the concerned local government units and Department of Agriculture representatives. Upon obtaining the necessary permissions, data were collected through non-invasive, researcher-administered survey questionnaires, with voluntary participation, informed consent, and confidentiality safeguards observed.

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