Administrative Management and Export of Hydrobiological Products in Artisanal Fishermen of San Andrés, Pisco-Ica: A Correlational Analysis

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Abstract

Objective: To evaluate the administration and procedures for the export of seafood products in the Ica area, recognizing the advantages, disadvantages and areas for improvement, based on the comparison between the results of applied research and the most recent commercial and productive statistics. Method: A descriptive and analytical method was used, supported by the review of specialized literature, the study of applied research on seafood exporting companies in Ica, and the inclusion of updated statistical data from PRODUCE, INEI and SUNAT (2024). Results: The results indicate that business management faces challenges in terms of innovation, collaboration, and diversification, which limits its ability to compete internationally. Extractive fishing focuses mainly on the production of fishmeal and fish oil, reaching 74. 8% by 2024, while aquaculture relies almost entirely on scallop farming, which made up 100% of aquaculture production in the region in 2024. Although regional exports increased by 12. 8%, concentration on production and the limited capacity of companies to adapt represent strategic challenges. Conclusion: Improving administration and diversifying exports are essential aspects to increase the competitiveness of the hydrobiological products sector in Ica. It is suggested to promote public policies and business strategies focused on innovation, added value and sustainability, so that the sector contributes effectively to regional development and achieves a stronger insertion in global markets.

Keywords: Administrative Management, Export, Hydrobiological Products, Artisanal Fishermen.

Introduction

Marine ecosystems are an essential source of resources that have great nutritional and economic value. According to the FAO (2020), "fisheries and aquaculture are still key sectors for food, employment and trade, but they must face the urgent challenge of achieving sustainability" (p. 15). In Peru, the richness of its coastline has allowed fishing to establish itself as one of the pillars of both the national and regional economy, playing a crucial role in exports and food security.

Among the most important hydrobiological products is Argopecten purpuratus, known as fan

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shell, whose demand in the international market has increased due to its organoleptic and nutritional qualities. PROMPEX (2020) indicates that "the scallop is one of the main non-traditional products for export in the fishing sector, with opportunities for consolidation in the markets of Europe and Asia" (p. 8). In the region of Ica, especially in the district of San Andrés, different aquaculture associations are dedicated to its cultivation and sale. However, they face difficulties in production management, compliance with closures and marketing strategies, which generates a dependence on intermediaries and decreases their profitability.

The economic relevance of the sector in the region is evident in the latest production indicators. According to PRODUCE (2024), "Ica's maritime extractive fishing accounted for 12. 7% of the national total; 74. 8% of the resources were allocated to the production of fishmeal and fish oil, while only 14%. 1% went to frozen, canned and cured products" (p. 3). In aquaculture, "during the year 2024, the cultivation of scallops stood out, reaching 1,907 MT, which means an increase of 2,008% compared to the previous year" (p. 2). These statistics underscore the region's export potential, although they also reveal the fragility of a production model that lacks diversification.

In this context, administrative management acquires significant importance. Münch (2014) states that "administrative management is a systematic process where the human, material, technological and financial resources of an organization are coordinated, planned, organized, directed and controlled, with the aim of achieving institutional objectives in an effective, efficient and competitive manner" (p. 22). Similarly, Robbins (2014) points out that "the administrative process includes the functions of planning, organizing, directing, and controlling, which are essential to achieve results in complex organizations" (p. 45). Applying these principles in the artisanal fisheries sector is crucial to improving production and meeting the demands of international markets.

However, the available information reveals limitations in this field. Valderrama (2014) points out that "MSEs that belong to the commercial and service sector face problems in quality management and competitiveness, which restricts their long-term permanence" (p. 66). Similarly, Huamán (2019) indicates that "the lack of an export culture in marine products adversely affects environmental management and the competitiveness of companies" (p. 103). These results are consistent with those presented by Lara (2017), who in the context of Ecuador evidenced that "there is a significant positive correlation between administrative management and effectiveness in artisanal fishing activity" (p. 87).

In the district of San Andrés, in the province of Pisco, this situation is reflected in the weak administrative management of the groups of artisanal fishermen and aquaculturists, who, despite having resources of high commercial value, are not able to successfully integrate into international markets. The central question raised in this research is: What is the link between administrative management and the export of marine products in the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica?

The purpose of this study is to examine that relationship, incorporating the findings of applied research together with updated regional indicators (Khattak et al., 2021). The importance of the work lies in the fact that the strengthening of administrative management – through effective planning, organization, direction and control – can become an essential tool to diversify the export offer, raise international competitiveness and support the sustainable development of the Ica region, which in 2024 contributed to the 4. 1% to national GDP (PRODUCE, 2024, p. 1).

From this perspective, the justification for the study is based on two aspects. First, in the

academic field, it seeks to fill a gap in the literature on the relationship between administrative management and export performance within the artisanal fishing sector. Although there is research on sales processes, internal control or environmental management, there are few studies that comprehensively address the impact of administrative practices on the international insertion capacity of fishing organizations. Thus, this article enriches the knowledge in the area of administration applied to the fishing sector, providing empirical evidence from a specific case in Ica.

Secondly, from a practical and social approach, the study aims to generate useful information for the decision-making of those involved in the value chain of hydrobiological products: fishermen's associations, regional authorities and entities that promote exports. Identifying strengths and weaknesses in administrative management will allow the development of intervention strategies focused on innovation, partnership, and sustainability, with the aim of enhancing regional competitiveness and reducing dependence on intermediaries in international trade. In this way, the article contributes not only to the internal improvement of organizations, but also to the economic and social development of the Ica region, where more than 467 thousand workers depend on productive activity (PRODUCE, 2024, p. 2).

Research Problem

Main Issue

What is the relationship between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco - Ica, 2025?

Specific Issues

- What is the association between administrative planning and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025?

- How is the administrative organization linked to the export of hydrobiological products in the artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025?

- What is the correlation between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025?

- What correspondence exists between administrative control and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025?

Objectives

General OBJECTIVE

To determine the relationship between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Specific Objectives

- To analyze the association between administrative planning and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

- To establish the link between the administrative organization and the export of hydrobiological products in the artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

- To identify the correlation between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

- To evaluate the correspondence between administrative control and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Hypothesis

General hypothesis

HG: There is a significant relationship between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

HGo: There is no significant relationship between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Specific hypotheses

HE1: There is a significant association between administrative planning and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

HE10: There is no significant association between administrative planning and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

HE2: There is a significant link between the administrative organization and the export of hydrobiological products in the artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

HE20: There is no significant link between the administrative organization and the export of hydrobiological products in the artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

HE3: There is a significant correlation between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

HE30: There is no significant correlation between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

HE4: There is a significant correspondence between administrative control and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

HE40: There is no significant correspondence between administrative control and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Methodology

Focus, type and level of research

Research Approach

The research adopts a quantitative approach, characterized by the systematic collection of numerical data to contrast hypotheses through rigorous statistical procedures. This approach allows establishing causal and correlational relationships between variables, using standardized measurement methods that guarantee the objectivity and replicability of the study (Hernández et al., 2014). The quantitative nature of the study facilitates the generalization of results and the statistical validation of the relationships between administrative management and export of hydrobiological products.

Type of Research

A basic research is developed, aimed at generating scientific knowledge on the relationships between administrative and commercial variables in artisanal fishing organizations. This type of research contributes to the theoretical development of the field of study without immediate application purposes, allowing to expand the scientific understanding of administrative management in artisanal fishing contexts (Parraguez et al., 2017).

Research Level

The study is developed at a descriptive-correlational level. The descriptive component allows to characterize in detail the variables administrative management and export of hydrobiological products in their natural context. The correlational component seeks to determine the degree of association between these variables, establishing relationship patterns without experimental manipulation (Hernández et al., 2014). This level is appropriate for identifying significant relationships between administrative dimensions and export performance.

Research Design and Method

Research method

General Method: Hypothetical-Deductive

The hypothetical-deductive method is used, which is a scientific procedure structured in sequential stages: observation of the study phenomenon, formulation of explanatory hypotheses, deduction of logical consequences and empirical verification through statistical contrast (Hernández, 2010). This method integrates the rational moment (theoretical formulation) with the empirical moment (data verification), guaranteeing scientific rigor in the research process.

Specific Method: Statistical

The statistical method allows the systematic processing of quantitative data obtained by means of measuring instruments. It facilitates the application of hypothesis tests, correlation analysis,

and descriptive techniques to interpret the relationships between variables (Valderrama, 2014). The statistical procedures used include normality analysis, correlation tests and descriptive statistics.

Research Design

The research uses a non-experimental cross-sectional design. It is non-experimental because the independent variables are not manipulated, observing the phenomena in their natural context for subsequent analysis (Valderrama, 2017). It is transversal because data collection is carried out at a specific time, providing a "snapshot" of the situation at a given time (Hernández et al., 2014).

Population and sample of the research

Population

The target population is made up of 168 artisanal aquaculture fishermen formally registered with the Regional Directorate of Pisco Production, distributed in multiple associations in the district of San Andrés. This population represents the universe of artisanal fishermen with officially recognized aquaculture activity in the study area.

Sample

A non-probabilistic sampling is used for convenience, specifically selecting the Association of Artisanal Fishermen and Seafood Extractors of San Andrés. The sample comprises 55 participants: 25 active members and 30 collaborators, representing 32.7% of the total population. This selection is justified by accessibility, representativeness of the problem studied and willingness of the organization to participate in the study.

Data collection techniques and instruments

Techniques

The structured survey technique is used, defined as a standardized procedure to obtain systematic information from participants on specific study variables (Arias, 2012). This technique allows quantitative data to be collected in a uniform and controlled manner, facilitating comparability and subsequent statistical analysis.

Instruments

Two structured questionnaires with a Likert-type scale are used, specifically designed to measure the study variables:

Administrative Management Questionnaire: A 17-item instrument that assesses the dimensions of planning, organization, direction, and control in the artisanal fishing context.

Export Questionnaire: A 17-item instrument that measures direct and indirect export patterns, volumes traded, and operating profitability.

Both instruments use 5-point ordinal scales (1=Never, 2=Almost never, 3=Sometimes, 4=Almost always, 5=Always), providing greater measurement sensitivity than dichotomous scales.

Results

Descriptive Analysis

The sample was made up of 55 participants from the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, distributed in 25 active members (45.5%) and 30 collaborators (54.5%). 100% of the participants completed the questionnaires, obtaining an optimal response rate for statistical analysis.

Administrative Management Variable

Planning Dimension

ITEM	INDICATOR	YES (%)	NO (%)	INTERPRETATION
P1	Knowledge of Mission, Vision and Values	83.64	16.36	High level
Q2	Identification with organizational values	67.27	32.73	Moderate level
P3|	Knowledge of management objectives	0.00	100	Critical level

Table 1. Descriptive Analysis of the Planning Dimension

The planning dimension presents heterogeneous results. Although there is a high level of knowledge of basic institutional elements (83.64%), there is evidence of a critical deficiency in the communication of specific management objectives (0% knowledge), which represents a significant barrier to the effective implementation of organizational strategies.

Organization Dimension

ITEM	INDICATOR	YES (%)	NO (%)	INTERPRETATION
Q4	Clear definition of activities	25.00	75.00	Low level
Q5	Assertive distribution of human resources	15.00	85.00	Critical level
P6|	Efficiency in personnel distribution	16.00	84.00	Critical level

Table 2. Descriptive Analysis of the Organization Dimension

The organizational dimension shows significant structural deficiencies. 75% of the participants report a lack of clarity in the definition of activities, while more than 84% consider the distribution of human resources inadequate. These results suggest the absence of formal organizational structure and standardized processes.

Address Dimension

ITEM	INDICATOR	YES (%)	NO (%)	INTERPRETATION
P7	Staff motivation and advice	69.00	31.00	Moderate-high level
P8	Delegation of authority	15.00	85.00	Critical level
P9	Promotion of personal development	20.00	80.00	Low level
P 10	Training Programs	22.00	78.00	Low level
P 11	Meeting Production Targets	55.00	45.00	Moderate level
P 12	Mechanisms for productive improvement	96.00	4.00	High level

Table 4. Descriptive Analysis of the Management Dimension

The management dimension presents contrasting results. While there is a high availability of improvement mechanisms (96%) and a moderate level of personal motivation (69%), critical deficiencies are observed in delegation of authority (15%) and capacity development (20%). This pattern suggests a centralized leadership style with limited staff involvement.

Control Dimension

ITEM	INDICATOR	YES (%)	NO (%)	INTERPRETATION
P 13	Evaluation of plans and projects	4.00	96.00	Critical level
P 14	Permanent monitoring of activities	34.00	66.00	Low level
P 15	Reformulation of unsuccessful actions	87.00	13.00	High level
P 16	Information for individual evaluation	00.00	100.00	Critical level
P 17	Integration of organizational needs	2.00	98.00	Critical level

Table 5. Descriptive Analysis of the Control Dimension

The control dimension shows the greatest deficiencies of the administrative system. Fundamental aspects such as plan evaluation (4%), individual information management (0%) and organizational integration (2%) show critical levels. Only the reformulation of corrective actions presents a high level (87%), indicating reactive but not preventive capacity.

Variable Export

Indirect Export Dimension

ITEM	INDICATOR	YES (%)	NO (%)	INTERPRETATION
E1	Product Availability	69.00	31.00	Moderate-high level
E2	Determination of exportable volume	62.00	38.00	Moderate level
E3	Economic and financial capacity	38.00	62.00	Low level
E4	Domestic Customer Convenience	84.00	16.00	High level
E5	Export culture	47.00	53.00	Low level
E6	Convenience of intermediaries	51.00	49.00	Moderate level
E7	Demand Awareness	47.00	53.00	Low level
E8	Knowledge of export costs	38.00	62.00	Low level
E9	Promotional Tools	65.00	35.00	Moderate level
E10	Benefit of consortia	33.00	67.00	Low level
E11	Optimal price/performance ratio	62.00	38.00	Moderate level

Table 6. Descriptive Analysis of the Indirect Export Dimension

Indirect exports show adequate productive capacity (69% availability) and a preference for national channels (84%), but show limitations in financial capacity (38%), market knowledge (47%) and export culture (47%). This modality presents greater viability for the association in its current state.

Direct Export Dimension

ITEM	INDICATOR	YES (%)	NO (%)	INTERPRETATION
E 12	Direct export favorability	55.00	45.00	Moderate level

E 13	Better profits from direct export	38.00	62.00	Low level
E 14	Direct relationship with markets	44.00	56.00	Low level
E 15	Direct relationship with customers	29.00	71.00	Low level
E 16	Agent/distributor availability	34.00	66.00	Low level
E 17	Retail/Consumer Buyers	89.00	11.00	High level

Table 7. Descriptive Analysis of the Direct Export Dimension

Direct export has significant structural limitations. Although there is a high availability of end buyers (89%) and a moderate perception of favorability (55%), deficiencies are observed in the ability to establish direct business relationships (29%) and access to specialized channels (34%). The direct modality requires strengthening of commercial and financial capacities.

Inferential Analysis

Verification of Statistical Assumptions

Kolmogorov-Smirnov Normality Test

Variable	N	Stocking	D.E	KS Statistician	Gl	Gis.	Distribution
Administrative Management	55	39.81	4.56	0.109	55	0.001*	Non-parametric
Export	55	40.11	6.16	0.189	55	0.000*	Non-parametric

*$p < 0.05$, rejects H_0 for normality

Table 8. Normality Test for Study Variables

Statistical hypotheses:

H_0: Data is normally distributed

H_1: Data is not distributed normally

The results of the Kolmogorov-Smirnov test show significance values less than 0.05 for both variables ($p = 0.001$ and $p = 0.000$), rejecting the null hypothesis of normality. Therefore, it is confirmed that the data present a non-parametric distribution, justifying the application of non-parametric statistical tests for correlational analysis.

General hypothesis testing

Ha: There is a significant relationship between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Ho: There is no significant relationship between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Chi-square tests					
	Value	Mexico City	Asymptotic significance (bilateral)	Exact significance (bilateral)	Exact (one-sided) significance

Pearson's Chi-square	3,513a	1	,061		
Continuity correction[b]	2,077	1	,150		
Reason for plausibility	3,751	1	,053		
Fisher's Exact Test				,090	,074
Linear-by-Linear Association	3,450	1	,063		
N of valid cases	55				

Table 9. Pearson's Chi-square test - General Hypothesis

Statistical decision: With a bilateral significance value $p = 0.061 > 0.05$, the null hypothesis (H$_0$) at the 95% confidence level is accepted.

Therefore, there is insufficient statistical evidence to establish a significant relationship between administrative management and export of hydrobiological products in the population studied.

Testing of specific hypotheses 1: Administrative Planning

Ha1: There is a significant association between administrative planning and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025

Ho1: There is no significant association between administrative planning and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Chi-square tests					
	Value	df	Asymptotic significance (bilateral)	Exact significance (bilateral)	Exact (one-sided) significance
Pearson's Chi-square	.266a	1	,606		
Continuity correction[b]	,056	1	,812		
Reason for plausibility	,266	1	,606		
Fisher's Exact Test				,782	,407
Linear-by-Linear Association	,261	1	,610		
N of valid cases	55				

Result: $p = 0.606 > 0.05$. There is no statistically significant relationship between administrative planning and exportation.

Table 10. Chi-square test - Planning vs Export

Testing of specific hypotheses 2: Administrative Organization

Ha2: There is a significant link between the administrative organization and the export of hydrobiological products in the artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025

Ho2: There is no significant link between the administrative organization and the export of hydrobiological products in the artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025

Chi-square tests

	Value	df	Asymptotic significance (bilateral)	Exact significance (bilateral)	Exact (one-sided) significance
Pearson's Chi-square	.357a	1	,550		
Continuity correction[b]	,016	1	,898		
Reason for plausibility	,358	1	,550		
Fisher's Exact Test				,659	,447
Linear-by-Linear Association	,351	1	,554		
N of valid cases	55				

Result: p = 0.550 > 0.05. There is no statistically significant relationship between administrative organization and exports.

Table 11. Chi-square test - Organization vs Export

Specific hypothesis testing 3: Administrative Management

Ha3: There is a significant correlation between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Ho3: There is no significant correlation between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Chi-square tests

	Value	df	Asymptotic significance (bilateral)	Exact significance (bilateral)	Exact (one-sided) significance
Pearson's Chi-square	6,004a	1	,014		
Continuity correction[b]	4,548	1	,033		
Reason for plausibility	6,217	1	,013		
Fisher's Exact Test				,024	,016
Linear-by-Linear Association	5,895	1	,015		
N of valid cases	55				

Result: p = 0.550 > 0.05. There is no statistically significant relationship between administrative organization and exports.

Table 12. Chi-square test - Organization vs Export

Specific hypothesis testing 3: Administrative Management

Ha3: There is a significant correlation between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Ho3: There is no significant correlation between administrative management and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Chi-square tests					
	Value	Mexico City	Asymptotic significance (bilateral)	Exact significance (bilateral)	Exact (one-sided) significance
Pearson's Chi-square	6,004A	1	,014		
Continuity correction[b]	4,548	1	,033		
Reason for plausibility	6,217	1	,013		
Fisher's Exact Test				,024	,016
Linear-by-Linear Association	5,895	1	,015		
N of valid cases	55				

*p < 0.05, statistically significant

Result: p = 0.014 < 0.05. There is a statistically significant relationship between administrative management and the export of hydrobiological products. This is the only significant finding of the study.

Table 13. Chi-square test - Direction vs Export

Specific Hypothesis Testing 4: Administrative Control

Ha4: There is a significant correspondence between administrative control and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Ho4: There is no significant correspondence between administrative control and the export of hydrobiological products in artisanal fishermen of the Association of Artisanal Fishermen and Seafood Extractors of San Andrés, Pisco-Ica, 2025.

Chi-square tests					
	Value	df	Asymptotic significance (bilateral)	Exact significance (bilateral)	Exact (one-sided) significance
Pearson's Chi-square	1.136a	1	,286		
Continuity correction[b]	,003	1	,956		
Reason for plausibility	1,519	1	,218		
Fisher's Exact Test				,473	,473
Linear-by-Linear Association	1,115	1	,291		
N of valid cases	55				

Result: p = 0.286 > 0.05. There is no statistically significant relationship between administrative control and exports.

Table 14. Chi-square test - Control vs Export

Synthesis of Inferential Analysis

Hypothesis	Variable/Dimension	Chi²	P-Value	Decision	Result
General	Administrative Management - Export	3.513	0.061	Accepts H_0	In the significant
Specific 1	Planning - Export	0.266	0.606	Accepts H_{01}	In the significant
Specific 2	Organization - Export	0.357	0.550	Accepts H_{02}	In the significant
Specific 3	**Address - Export**	**6.004**	**0.014***	**Reject H_{03}**	**Significant**
Specific 4	Control - Export	1.136	0.286	Accepts H_{04}	In the significant

*p < 0.05

Table 15. Summary of Hypothesis Testing

Comprehensive interpretation: The inferential analysis reveals that only the dimension "Administrative Management" presents a statistically significant relationship with the export of hydrobiological products ($\chi^2 = 6.004$, $p = 0.014$). This finding suggests that aspects related to leadership, motivation, communication and staff coordination are critical factors for export success in artisanal fishing organizations, while the other administrative dimensions do not show statistically demonstrable influence.

Synthesis of Results

The results reveal a complex panorama in the relationship between administrative management and export of hydrobiological products:

Administrative Management: It has significant structural deficiencies, especially in strategic planning, formal organization and control systems.

Export: The indirect modality shows greater current viability, while direct export requires capacity building.

General correlation: There is no statistically significant relationship between the main variables ($p = 0.061$).

Specific Correlations: There are significant relationships between specific dimensions that suggest priority areas of intervention.

Discussion of the Results

The findings of the research show that, in general, there is no statistically significant relationship between administrative management and the export of hydrobiological products in the Association of Artisanal Fishermen and Seafood Extractors of San Andrés ($\chi^2 = 3.513$; $p = 0.061$). However, the analysis by dimensions showed that administrative management does maintain a significant correlation with export activity ($\chi^2 = 6.004$; $p = 0.014$). This result suggests that aspects related to leadership, motivation, communication and coordination of personnel are critical factors to enhance export capacity, even when planning, organization and control do not show statistically significant effects.

This finding is partially consistent with previous research. Urbina, Norvin, and Zelaya (2013) found that "the deficient administrative management of the COMEXPROCCAFE cooperative

compromised the interests of the members and weakened their insertion in the international market, due to the absence of strategic planning, poor organization, and inefficient control mechanisms" (p. 45). In a similar vein, Lara (2017) concluded that "there is a very strong to perfect positive correlation between administrative management, as well as each of the dimensions that compose it, and the efficiency of artisanal fishing activity in the Canton of Manta" (p. 92). This reinforces the idea that the quality of leadership and the ability to guide work teams are determining elements for competitiveness in associative organizations.

The results obtained must also be analyzed in the light of the regional context. The Regional Productive Diagnosis (PRODUCE, 2024) reports that "maritime extractive fishing in Ica represented 12.7% of the national fishery; 74.8% of the resources were allocated to the production of fishmeal and fish oil, while only 14.1% was directed to frozen, canned and cured fish" (p. 3). It was also reported that "during 2024, the cultivation of scallops (100%; 1,907 MT), which meant an increase of 2,008% compared to the previous year" (p. 2). These data reflect a pattern of high productive concentration, which limits export diversification and increases vulnerability to changes in international demand or environmental fluctuations.

The absence of significant correlation in most of the administrative dimensions identified in this study may be related to the structural conditions indicated in the same regional diagnosis. According to PRODUCE (2024), "micro and small enterprises (MSEs) predominate in Ica, of which 72.0% are informal" (p. 1). This fragmented business environment with low formalization constitutes a barrier to the strengthening of administrative management, hindering strategic planning and the implementation of control systems in artisanal fishing associations.

Consequently, it can be said that the results of this research reveal a gap between the regional export dynamism and the internal administrative limitations of the craft associations. While Ica's exports grew by 12.8% in 2024 (PRODUCE, 2024, p. 1), the lack of significant correlation between administrative management and exports in the case analyzed suggests that such growth does not translate into direct benefits for grassroots organizations, but is concentrated in larger-scale and capitalized productive segments.

In this way, the results confirm that in order to strengthen the export capacity of the artisanal associations of San Andrés, it is necessary to promote administrative management that prioritizes the development of leadership, the motivation of the associates and effective communication, in parallel with public policies that promote the diversification of products and the reduction of exclusive dependence on the scallop. Only in this way will it be possible to overcome the paradox of regional export growth that is not reflected in sustainable improvements for small producers.

Conclusions

A statistically relevant study between the administration and export of seafood products in the Association of Artisanal Fishermen and Seafood Extractors of San Andrés (χ^2 = 3.513; p = 0.061). However, it was observed that administrative management does indeed show a significant relationship with export activities (χ^2 = 6.004; p = 0.014), which demonstrates that "factors related to leadership, motivation, communication and team coordination are fundamental elements for export success in artisanal fisheries organizations" (Research results, 2025, p. 175).

Second, these findings are consistent with previous studies. Lara (2017) concluded that "there is a positive correlation, ranging from very strong to perfect, between the administration and each of the dimensions that form it, and the efficiency of artisanal fishing work in the Manta Canton" (p. 92). Similarly, Urbina, Norvin, and Zelaya (2013) found that "inadequate administrative management in the COMEXPROCCAFE cooperative put the interests of the members at risk and weakened its presence in the global market" (p. 45). In this context, empirical evidence reinforces that management and leadership are essential dimensions to maintain the competitiveness of artisanal associations' exports

Thirdly, the regional context shows dynamics that help to understand the limitations encountered. According to PRODUCE (2024), "Ica's exports increased by 12. 8% in 2024, reaching a total of 21,793 million FOB dollars" (p. 1). However, this growth was concentrated in a few sectors: "74. 8% of fishery resources were used for the production of fishmeal and fish oil, while only 14. 1% was destined for frozen, canned and cured products" (p. 3). In the field of aquaculture, "in 2024, the cultivation of scallops (100%; 1,907 MT), which represented an increase of 2,008% compared to the previous year" (p. 2). This concentration of production presents a pattern of vulnerability and explains why the dynamism of exports in the region does not translate into a direct strengthening for artisanal associations with weak administrative structures.

Fourth, it is important to take into account the structural and socio-economic factors of the region. The report mentions that "Ica has a population of 1,038,328 inhabitants, with an employed EAP of 467,192 workers, of which 64. 7% are dedicated to services and commerce, and only 17. 4% to the agricultural sector" (PRODUCE, 2024, p. 2). In addition, "72. 0% of MSEs in Ica operate informally" (PRODUCE, 2024, p. 1). This environment limits the development of solid organizational capacities, reducing the impact of the administration in the export field and leading producers to depend on intermediaries.

Fifth, the economic impact of the region at the national level shows the relevance of the sector. According to the PRODUCE report (2024), "Ica's contribution to the national GDP in 2024 was 4. 1%, with a cumulative increase of 4. 3% in the period 2019-2024, and a GDP per capita of 20,988 soles" (p. 1). However, the lack of diversification in fisheries and aquaculture production creates a paradox: although there is potential and growth in macroeconomic terms, this does not translate into sustainable benefits for artisanal associations.

Finally, it is determined that the case studied is a reflection of a broader regional reality: the increase in Ica's exports has not been accompanied by a similar strengthening in the administration of its artisanal fishing organizations. Therefore, it is suggested:

1.   Promote leadership and management training programs within associations.

2.   Promote public policies that reduce informality in businesses and strengthen strategic planning.

3.   Stimulate diversification in production and export, reducing dependence on scallops and low value-added fishery products.

Only through the implementation of these strategies will it be possible to close the gap between the dynamism of regional exports and the true capacities of Ica's artisanal fishermen, contributing sustainably to economic and social development.

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