

Characterization of artisanal spiny lobster fishing on the coast of Paraíba and socioeconomic aspects of fishermen

Patricia Aguiar de Oliveira^{1*} , Reinado Farias Paiva de Lucena¹ 

¹ Federal University of Paraíba – Campus I, Center of Exact and Natural Sciences, Department of Systematics and Ecology, Laboratory of Ethnobiology and Environmental Sciences.

*Corresponding author: profvet.patricia@gmail.com

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Abstract - A socioeconomic survey of lobster fishermen in the state of Paraíba was carried out through interviews conducted between July 2015 and December 2017. The survey used in this study was comprised of 40 questions seeking information on artisanal fishermen to aid government agencies in developing future support policies based on local scenarios. The artisanal fishermen catching lobster in Paraíba are mostly adults, aged between 31 and 50 years, married, and have been fishing for more than 30 years and, depending on the weather, work 3 to 4 days a week. Their average monthly income is 3 minimum wages, which is usually complemented by extra activities such as civil construction and other fishing-related jobs.

Keywords: Ethnoichthyology. Ethnozoology. Traditional Population.

Caracterização da pesca artesanal de lagosta e aspectos socioeconômicos dos pescadores no litoral da Paraíba

Resumo - O levantamento socioeconômico dos pescadores de lagosta da Paraíba, foi realizado entre julho/15 e dezembro/17, através de entrevistas baseadas em 40 questões visando gerar informações sobre os pescadores artesanais que auxiliem aos órgãos governamentais delinear futuras políticas de apoio, baseado na realidade local. Os pescadores artesanais que atuam na captura da lagosta na Paraíba são em sua maioria adultos, com idade entre 31 e 50 anos, casados, que pescam há mais de 30 anos, e, dependendo das condições climáticas, trabalham de 3 a 4 dias por semana. Possuem renda mensal média de 3 salários mínimos, que normalmente é complementada com atividades extras como construção civil e outras ligadas à pesca.

Palavras-chave: Etnoictiologia. Etnozoologia. População Tradicional.

Caracterización de la pesca artesanal de langosta y aspectos socioeconómicos de los pescadores en el litoral del estado de Paraíba

Resumen – Se llevó a cabo un levantamiento socioeconómico de los pescadores de langosta entre julio de 2015 y diciembre de 2017 en el estado de Paraíba, a través de entrevistas con un cuestionario basado en 40 preguntas para la obtención de informaciones sobre los pescadores artesanales que faciliten a los órganos gubernamentales en el desarrollo de políticas de apoyo futuras basadas en la realidad local. Los pescadores artesanales que actúan en la captura de langostas en Paraíba son, en su mayoría, adultos con edades entre 31 y 50 años, casados, que pescan desde hace más de 30 años y que, a depender de las condiciones climáticas, trabajan de 3 a 4 días a la semana. Su renta media es de 3 salarios mínimos mensuales, la cual normalmente se complementa con actividades extras como la construcción civil y otras ligadas a la pesca.

Palabras clave: Etnoictiología. Etnozoología. Población Tradicional.

Introduction

From a global and national perspective, fishing is an important source of income for coastal populations of low economic means (Mariano and Rosa 2010). The fishing sector generates jobs and supports the livelihood of many fishing families along the Brazilian coast, in addition to being a source of food rich in protein. Moreover, artisanal fishing contributes 50 to 68% of the protein consumed by a coastal population (Silvano 2004; Begossi *et al.* 2010).

In 2011, the northeast coastal region accounted for Brazil's largest national fish production from extractive marine fishing, with a catch of 186,012 tons (Brasil 2012). In this region, artisanal fishing prevails, employing small vessels to catch fish, shrimp and lobster (Brasil 2008).

Artisanal fishing is characterized by fisherman using relatively simple gear, participating directly or indirectly in catching fishing resources, whether alone or in partnerships (Ramires *et al.* 2012). The Brazilian legislation defines the artisanal fisherman as one who performs the activity autonomously in a family or cooperative regime without employment ties (Brasil 2003).

Artisanal fishermen are a traditional community because they have unique and specific knowledge of marine ecosystem dynamics and they participate in the management and administration of local biodiversity due to their dependence on the natural resources of an area for survival (Hanazaki 2003)

Despite its short coastline, the state of Paraíba is a powerful fishing exporter, primarily due to the Port of Cabedelo and its performance in ocean fishing. Data on lobster export in Paraíba (MDIC 2018) reveal that in 2017, 39,430 kg of whole lobster were exported, generating US \$700,304, an increase of 178.09% compared to 2016, when 14,450 kg of lobster were caught, generating US \$251,825.

Lobster fishing on the Paraíba coast is an important source of income for many families of artisanal fishermen. The demand generated by the consumer market, linked to growing regional tourism, contributes to: increased fishing effort (number of boats and intensity of use); fishing above the maximum sustainable limit; illegal fishing (use of illegal traps, diving air compressors and caçoeira-type nets); non-compliance with the minimum catch size; and disregard of closed season prohibition (Oliveira *et al.* 2009).

Due to such pressure, artisanal fishermen typically work alone and are driven by monetary gain (Woortmann 1991; Prost 2007). As a result, fishery resources are affected by the adoption of a development pattern that disrupts the harmony between natural and social systems (Leff 2009).

Through research and definition of the social, economic and environmental elements relating to the lobstermen of the state of Paraíba, their socioeconomic profile was outlined by analysing descriptors such as age, educational level, marital status, income, etc., and the characterization of fishing with respect to time, days, locations and fishing gear, vessels used, species caught, lobster catch inspection, etc. Thus, this study analyses fishing and socioeconomic characteristics of lobster fishing based on method used (Ethno) of artisanal lobstermen active on the coast of Paraíba.

Material and Methods

Study site

Located in the eastern portion of the state of Paraíba, the study site is an integral part of the Mata Paraibana Mesoregion, which is bordered to the north by the state of Rio Grande do Norte, to the south by the state of Pernambuco, to the east by the Atlantic Ocean and to the west by the Agreste zone of Paraíba. Covering eleven municipalities distributed along the coast and 36 fishing communities, the coastline is characterized by the presence of a variable landscape, with zones of tablelands, cliffs, dunes, coastal plains, coastal ridges, estuaries, mangroves, beaches, restingas and Atlantic forest remnants (SUDEMA 1996).

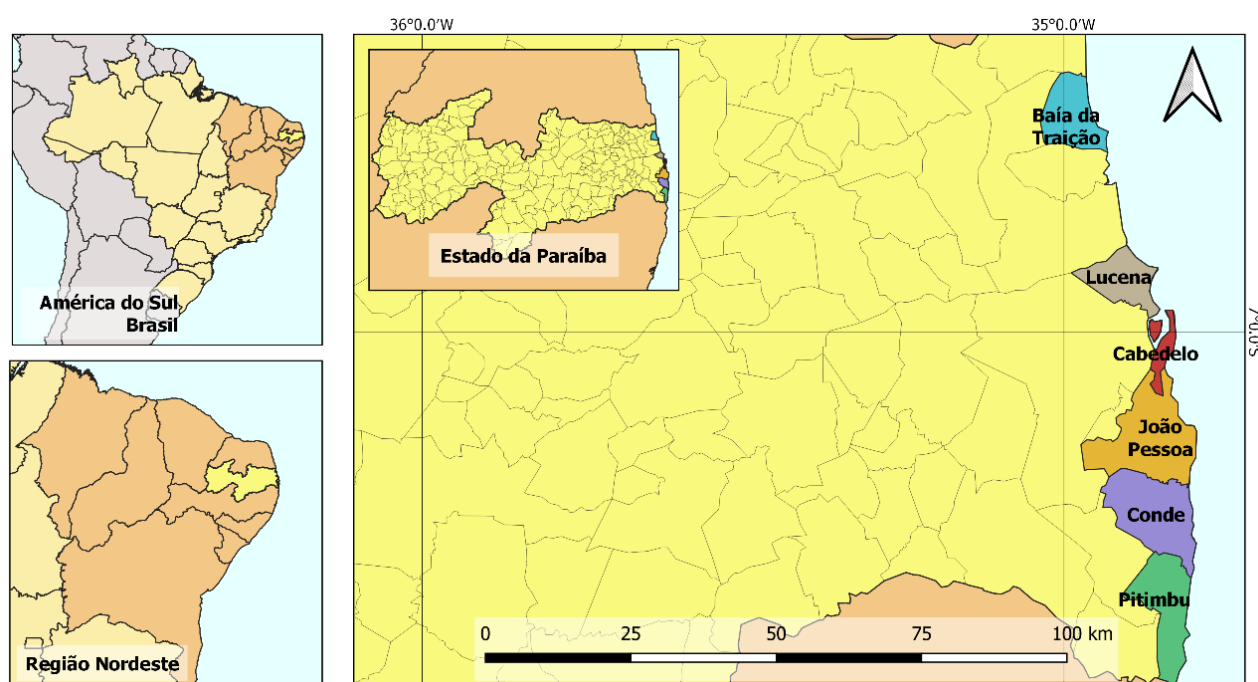
The continental shelf of Paraíba has a predominantly limestone substrate, which occupies a range of 20 nautical miles, with a maximum depth at the margin of the slope of approximately 200 m (Carvalho 1983) and has numerous reef formations bordering the coastline. The shelf extends approximately 140 km to the north of the Guaju River estuary and south past the Goiana River estuary (Neves et al. 2006). The presence of this substrate and the reef environment is important for the life cycle of lobsters. According to George (2006), spiny lobster of the family Palinuridae exhibit evolutionary habitat differentiation, with some species inhabiting the coastal reefs throughout their entire benthic life cycle, whereas other species migrate to deep waters during the adult and juvenile stages.

According to the CEPENE Fisheries Statistics Bulletins CEPENE (2000-2007), in the state of Paraíba, lobster landing occurs in the municipalities of Pitimbu, Conde, João Pessoa, Cabedelo, Marcação and Baía da Traição. The STATPESCA/IBAMA programme was discontinued in 2008, and thus, there are no current data on landings. According to information collected in the first stage of the study from the local lobstermen of Fishermen Colony Z14 – Antônio Izidorio da Silva, no longer is there significant lobster fishing in the municipality of Marcação. Information collected in colonies Z19 – Antônio Felipe dos Santos and Z5 – Benjamin Constant, in the municipality of Lucena, revealed that there is effective lobster fishing in these locations. Thus, the data collection points were distributed in six municipalities, three along the northern coast (Baía da Traição, Lucena and Cabedelo) and three along the southern coast (João Pessoa, Conde and Pitimbu), as shown in Table 1 and Figure 1.

Table 1. Fishermen colonies studied along the Paraíba coast where lobster landing is present, including the respective municipalities and primary communities sampled

Zn*	Fishermen colony**	Municipality	Sampled community
Z1	Comandante Oscar Gonçalves	Baía da Traição	Baía de Traição
Z2	Presidente Eptácio Pessoa	Cabedelo	Porto, Miramar, Formosa, Areia Dourada and Camboinha
Z3	André Vidal de Negreiros	João Pessoa	Tambaú, Seixas, Penha and Jacarapé
Z4	Henrique Dias	Pitimbu	Pitimbu
Z5	Benjamin Constant	Lucena	Lucena
Z9	João João dos Santos	Conde	Jacumã
Z10	Manoel Augusto de Lima	Pitimbu	Acaú
Z19	Antônio Felipe dos Santos	Lucena	Costinha

*Symbols used by the fishermen colonies to mark and number fishing zones (Z) in the order of their establishment within each state jurisdiction. **Trade name of the colony.

Figure 1. Location of lobstermen colonies in the municipalities of Pitimbu, Conde, João Pessoa, Cabedelo, Lucena and Baía da Traição and Paraíba (Northeast Brazil).

Data collection and analysis

This study was submitted to the Human Research Ethics Committee of the Centre for Health Sciences of the Federal University of Paraíba (Universidade Federal da Paraíba – UFPB) and was approved during the seventh meeting on 08/2015, opinion no. 0339/15, CAAE no. 45785315.5.0000.5188.

In the period from July 2015 to December 2017, 100 questionnaires were administered to the lobstermen of the state of Paraíba. The objective of the study was explained to each respondent, who

were asked to sign a free and informed consent form, as required by the National Health Council through the Research Ethics Committee (CNS Resolution 46612).

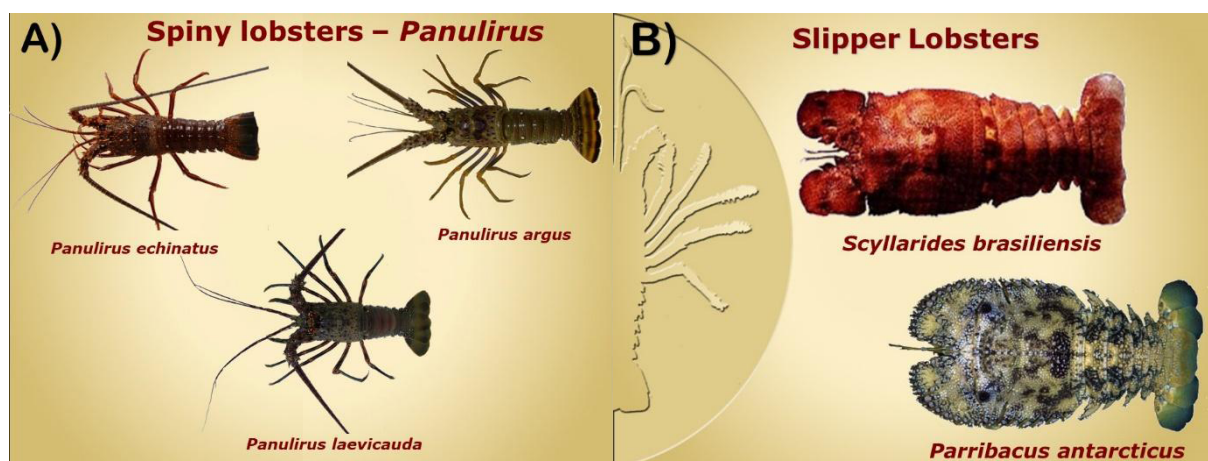
A meeting was held with the president of each colony that participated in the study during which a certificate was completed granting approval for the study.

In this study, two stages were adopted to select the respondents. First, open or free interviews were conducted with ten lobstermen, five from the southern coast and five from the northern coast, to guide the context to be studied. From the data obtained, scripts were structured for the application of the questionnaires. The technique used for the collection of socioeconomic data was a structured interview (Gil 1999), composed of 40 questions, 11 on the profile of the lobstermen and 29 on lobster fishing.

In the second stage, we began the interviews with the president of the local fishing colony, who later identified lobstermen with more time involved in and knowledge of the activity, given the president's familiarity with these individuals. Starting with the lobstermen indicated by the president, a snowball technique was used, in which a potential respondent is recommended by the lobstermen who have already answered the questionnaire (Bailey 1994). This technique works with reference chains for recruitment, making use of relationships among people. Thus, after each interview, the respondent was asked to indicate other lobstermen who could participate in the study, and the process was repeated with new respondents to form a network (Patton 2002).

Photographs of live lobsters were used as recognition stimuli. A pilot test was conducted where the photographs were shown to various lobstermen to evaluate their usefulness and accuracy for different lobster species (Figure 2).

Figure 2. Images of A) spiny lobsters – (*Panulirus echinatus*, *P. argus* and *P. laevicauda*); and B) slipper lobsters – (*Scyllarides brasiliensis* and *Parribacus antarcticus*) shown to lobstermen to identify the species of lobsters caught in the state of Paraíba.



Fishing activities, cultural scenes, social actors and faunal resources were recorded digitally through photography, thus providing important visual information.

To analyse the desire to complement their family income, the lobstermen's interest in participating in the creation/development of a protocol for the cultivation of lobster in captivity was also investigated.

Based on the federal government's transparency portal, the number of lobstermen in the studied municipalities who receive closed season benefits, according to the Brazilian Institute of Environment

and Renewable Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis – IBAMA) regulation no. 206 from 11/14/2008, was surveyed. The Closed Season Benefit is intended for artisanal fisherman who fish artisanally or in a family economy arrangement during the period of fishing prohibition of some species.

The data analysis was performed based on the number of mentions made by the interviewed lobstermen, and the relative frequencies of the responses were calculated using Microsoft Excel.

Results and Discussion

Lobstermen profile

A total of 100 lobstermen from the state of Paraíba were interviewed, 50 from the southern coast [Pitimbu (23), Conde (12) and João Pessoa (15)] and 50 from the northern coast [Cabedelo (17), Lucena (9) and Baía de Traição (24)]. According to the federal government's transparency portal (Controladoria Geral da União 2018), the analysed municipalities have a total of 1,206 fishermen who receive closed season benefits in accordance with IBAMA regulation no. 206 of 11/14/2008, which are distributed as follows: Baía da Traição (168); Lucena (54); Cabedelo (170); João Pessoa (146); Conde (99); and Pitimbu (569). No women working in the area of lobster fishing in the state of Paraíba were interviewed, although 21 fisherwomen are registered (Lucena: 1; Cabedelo: 6; João Pessoa: 3; Conde: 9; and Pitimbu: 2) as receiving the closed season benefits. During the research, no woman presented herself as a lobster fisherman. When asking the fishermen, none of the interviewees identified women in lobster fishing.

The socioeconomic information of the lobstermen interviewed in the present study reveals that the majority (38.33%) are between the ages of 41 and 50 (Table 2). Mendonça *et. al* (2017) found a similar profile on the coast of Paraná, where the average age was 44 years. In Redonda-Icapui, Ceará, Galdino (1995) recorded a lower mean age (35 years) than that of lobstermen from Paraíba. The small number (3.53%) of young people involved in fishing activities reflects a possible trend that older lobstermen do not desire the same future for their children, although they do not prohibit them if they want to learn and continue as lobstermen, but their children are always encouraged to attend school to have a better chance at succeeding in other professions.

Regarding educational level, 33.49% of the lobstermen did not complete primary school, and a survey conducted in Ceará (Vieira 2007) and in Brasília Teimosa, Pernambuco (Mariz *et. al* 2014) found an even lower percentage of respondents (32.3 and 26.1%, respectively) did not have a primary education. Some of the respondents claim that being a lobsterman requires significant effort, with no time to devote to studying. The older individuals reported that when they were attending school, there was only a primary school where they lived, and they were not able to go to another municipality to attend secondary school.

Most lobstermen are married (48.58%), and others (37%) have maintained a stable union for several years. The older lobstermen reported that it was necessary to travel great distances from their community to get a marriage license and thus they and their partners decided to simply “live together”, a situation with which both were comfortable. Mariz *et. al* (2014) found in Brasília Teimosa that 79.5% of lobstermen were married and some had no marriage license.

Religion is very much a part of the lives of most lobstermen; more than half (61.37%) are Catholics and a considerable portion (21.29%) stated having no religion affiliation but believe in God

and sometimes call themselves “non-practising Catholics”. When religious festivals such as Our Lady of Navigators and the Feast of Saint Peter occur in the surveyed communities, the vast majority of lobstermen participate in the river processions, and even the non-practitioners are present during the festivities. Vieira (2007) found a total of 77.4% of the fishermen in the community of Flexeiras, Ceará identify as Catholic; however, there are those who stated they do not practise the faith often due to laziness or because there are few religious festivals in their community.

Table 2. Socioeconomic aspects and associated relative frequency of the lobstermen of the six coastal municipalities: Baía da Traição, Lucena, Cabedelo, João Pessoa, Conde and Pitimbu, Paraíba.

Lobstermen data		B. Traição		Lucena		Cabedelo		J. Pessoa		Conde		Pitimbu		Total	
N		24	%	9	%	17	%	15	%	12	%	23	%	100	%
Age	21 to 30	1	4,17	1	11,11	1	5,88	0	0,00	0	0,00	0	0,00	3	3,53
	31 to 40	9	37,50	0	0,00	7	41,18	5	33,33	6	50,00	8	34,78	35	32,80
	41 to 50	8	33,33	5	55,56	6	35,29	5	33,33	4	33,33	9	39,13	37	38,33
	51 to 60	4	16,67	1	11,11	1	5,88	4	26,67	1	8,33	4	17,39	15	14,34
	≥60	2	8,33	2	22,22	2	11,76	1	6,67	1	8,33	2	8,70	10	11,00
Education	Illiterate	4	16,67	2	22,22	3	17,65	0	0,00	7	58,33	4	17,39	20	22,04
	Incomplete primary	10	41,67	1	11,11	5	29,41	3	20,00	1	8,33	8	34,78	28	24,22
	Complete primary	8	33,33	4	44,44	8	47,06	5	33,33	2	16,67	6	26,09	33	33,49
	Secondary	2	8,33	2	22,22	1	5,88	5	33,33	2	16,67	5	21,74	17	18,03
	Higher	0	0,00	0	0,00	0	0,00	2	13,33	0	0,00	0	0,00	2	2,22
Civil Status	Single	3	12,50	1	11,11	1	5,88	5	33,33	1	8,33	2	8,70	13	13,31
	Married	8	33,33	7	77,78	10	58,82	6	40,00	3	25,00	13	56,52	47	48,58
	Living together	13	54,17	1	11,11	6	35,29	3	20,00	8	66,67	8	34,78	39	37,00
	Divorced	0	0,00	0	0,00	0	0,00	1	6,67	0	0,00	0	0,00	1	1,11

Lobstermen data		B. Traição		Lucena		Cabedelo		J. Pessoa		Conde		Pitimbu		Total	
N		24	%	9	%	17	%	15	%	12	%	23	%	100	%
Religion	Catholic	19	79,17	3	33,33	13	76,47	7	46,67	6	50,00	19	82,61	67	61,37
	Evangelical	1	4,17	0	0,00	3	17,65	5	33,33	2	16,67	3	13,04	14	14,14
	Spiritist	1	4,17	0	0,00	0	0,00	0	0,00	1	8,33	0	0,00	2	2,08
	No religion	3	12,50	6	66,67	1	5,88	2	13,33	3	25,00	1	4,35	16	21,29
	Other	0	0,00	0	0,00	0	0,00	1	6,67	0	0,00	0	0,00	1	1,11
Fishing income	≤ R\$ 200	0	0,00	0	0,00	0	0,00	1	6,67	0	0,00	0	0,00	1	1,11
	R\$ 201 a R\$ 400	1	4,17	0	0,00	0	0,00	1	6,67	0	0,00	0	0,00	2	1,81
	R\$ 401 a R\$ 600	0	0,00	0	0,00	0	0,00	2	13,33	2	16,67	0	0,00	4	5,00
	R\$ 600 a R\$ 1,000	0	0,00	6	66,67	2	11,76	0	0,00	0	0,00	0	0,00	8	13,07
	R\$ 1,001 a R\$ 2,000	19	79,17	0	0,00	0	0,00	1	6,67	7	58,33	1	4,35	28	24,75
	R\$ 2,001 a R\$ 3,000	4	16,67	2	22,22	11	64,71	5	33,33	2	16,67	1	4,35	25	26,32
	R\$ 3,001 a R\$ 4,000	0	0,00	1	11,11	3	17,65	4	26,67	0	0,00	13	56,52	21	18,66
	R\$ 4,001 a R\$ 5,000	0	0,00	0	0,00	1	5,88	0	0,00	0	0,00	7	30,43	8	6,05
	R\$ 5,001 a R\$ 6,000	0	0,00	0	0,00	0	0,00	0	0,00	1	8,33	0	0,00	1	1,39
R\$ 6,001 a R\$ 7,000	0	0,00	0	0,00	0	0,00	1	6,67	0	0,00	1	4,35	2	1,84	
Always worked with fishing		22	91,67	6	66,67	11	64,71	7	46,67	7	58,33	23	100,00	76	71,34
Have worked in other areas		2	8,33	3	33,33	6	35,29	8	53,33	5	41,67	0	0,00	24	28,66
What activity did you do before?	Agriculture	0	0,00	0	0,00	1	5,88	0	0,00	1	8,33	0	0,00	2	2,37
	Retail	0	0,00	0	0,00	1	5,88	1	6,67	0	0,00	0	0,00	2	2,09
	Construction	2	8,33	1	11,11	1	5,88	0	0,00	3	25,00	0	0,00	7	8,39
	Public service	0	0,00	0	0,00	0	0,00	2	13,33	0	0,00	0	0,00	2	2,22
	Domestic work	0	0,00	0	0,00	0	0,00	1	6,67	0	0,00	0	0,00	1	1,11
	Odd jobs	0	0,00	0	0,00	1	5,88	1	6,67	1	8,33	0	0,00	3	3,48
	Other	0	0,00	2	22,22	2	11,76	3	20,00	0	0,00	0	0,00	7	9,00

Lobstermen data		B. Traição		Lucena		Cabedelo		J. Pessoa		Conde		Pitimbu		Total	
N		24	%	9	%	17	%	15	%	12	%	23	%	100	%
What do you do when you are not fishing?	Play soccer	0	0,00	0	0,00	0	0,00	1	6,67	0	0,00	0	0,00	1	1,11
	Talk to friends	14	58,33	0	0,00	1	5,88	1	6,67	0	0,00	0	0,00	16	11,81
	Watch television	1	4,17	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	1	0,69
	Housework	3	12,50	0	0,00	3	17,65	1	6,67	3	25,00	1	4,35	11	11,03
	Care for children	5	20,83	1	11,11	1	5,88	4	26,67	1	8,33	1	4,35	13	12,86
	Work another job	3	12,50	2	22,22	9	52,94	1	6,67	5	41,67	4	17,39	24	25,56
	Rest	2	8,33	1	11,11	3	17,65	1	6,67	1	8,33	13	56,52	21	18,10
	Other	4	16,67	6	66,67	1	5,88	9	60,00	3	25,00	4	17,39	27	31,93
Advantages of being a lobsterman	No boss	8	33,33	2	22,22	1	5,88	3	20,00	1	8,33	2	8,70	17	16,41
	Freedom	8	33,33	6	66,67	4	23,53	9	60,00	3	25,00	14	60,87	44	44,90
	Works when desired	1	4,17	0	0,00	0	0,00	1	6,67	0	0,00	0	0,00	2	1,81
	Good earnings	1	4,17	1	11,11	1	5,88	3	20,00	0	0,00	0	0,00	6	6,86
	Food security	17	70,83	2	22,22	14	82,35	6	40,00	7	58,33	10	43,48	56	52,87
	No advantage	2	8,33	1	11,11	0	0,00	1	6,67	1	8,33	0	0,00	5	5,74
	Other	0	0,00	1	11,11	0	0,00	0	0,00	0	0,00	0	0,00	1	1,85
Disadvantages of being a lobsterman	Lack of gear for work	2	8,33	1	11,11	4	23,53	1	6,67	2	16,67	5	21,74	15	14,67
	Difficulty obtaining credit	2	8,33	5	55,56	2	11,76	4	26,67	0	0,00	2	8,70	15	18,50
	Weak market	1	4,17	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	1	0,69
	Low earnings	0	0,00	3	33,33	0	0,00	1	6,67	1	8,33	2	8,70	7	9,50
	Hard work	19	79,17	2	22,22	10	58,82	6	40,00	8	66,67	15	65,22	60	55,35
	No disadvantages	3	12,50	1	11,11	0	0,00	2	13,33	0	0,00	0	0,00	6	6,16
	Other	1	4,17	1	11,11	1	5,88	4	26,67	1	8,33	0	0,00	8	9,36
Have considered quitting		8	33,33	4	44,44	7	41,18	3	20,00	7	58,33	3	13,04	32	35,06
Never considered quitting		16	66,67	5	55,56	10	58,82	12	80,00	5	41,67	20	86,96	68	64,94

The mean monthly income from lobster fishing was between R\$ 2,001 and R\$ 3,000. This value represents the earnings during the six months of permitted fishing that extends from June 1 to November 30; therefore, it is not a fixed monthly income because for six months most of the lobstermen stop fishing on account of the closed season established by regulation no. 206 of 11/14/2008. This income amount also varies according to weather conditions, the fishing gear used and whether the lobsterman owns the boat.

Other factors that also influence income are the number of days per week fishing is performed, the fishing site and to whom the lobster is sold. In the Frexeiras community, the lobstermen predominantly earn less than minimum wage (30 and 25.8%) per month from fishing, with only one among the 31 respondents earning approximately three times minimum wage, indicating large income variability among individuals who depend exclusively on fishing (Vieira 2007).

Fishing is the only source of income for 71.34% of the lobstermen. In the closed lobster season, the lobstermen receive income from closed season benefits and change the type of fishing they perform to target fish, molluscs and other crustaceans. The other 28.66% who worked a different job during the closed season did so in construction (8.3%), agriculture, retail, public service, domestic work and odd jobs (11.36%) and other sectors (9%). On the Paraná coast, more than 70% of fishermen also engage in fishing as their main economic activity (Mendonça *et al.* 2017). The complementary income-earning activities of fishermen in Ilhabela, São Paulo include: civil construction, domestic employment, public service and agriculture (Ramires *et al.* 2012). Studies by Begossi (1998) and Clauzet (2008) show that the various activities performed to complement the income of fishermen are a method of adapting to the variations in fishing income that cause financial instability due to noticeable reductions in fishery stocks and the expense of fishing activities.

When they are not fishing, 31.93% of the lobstermen are involved in another activity, typically related to fishing (repairing nets, renovating boats, fabricating fishing gear, such as traps). An additional 25.56% perform odd jobs to supplement their income and the remaining 42.51% play soccer, talk to friends, watch television, do housework, take care of their children and rest.

When asked about the advantages of being a lobsterman, more than half (52.87%) reported that having food security was the primary advantage, followed by having freedom in their work (44.90%). Fishing is the primary economic activity for several families, generating jobs, reducing poverty and supporting food consumption, especially in developing countries (Andrew *et al.* 2007, FAO 2005, Jentoft *et al.* 2011).

Regarding the disadvantages, more than half (55.35%) reported that lobster fishing is hard and tiring work, which eventually causes a series of illnesses. Nevertheless, 6.16% of the respondents stated that there were no disadvantages. Despite the disadvantages, 64.94% never considered retiring from being a fisherman. It should be noted that many of the respondents cited more than one category in their answers regarding the advantages and disadvantages.

According to Garrone Neto *et al.* (2005), because fishermen do not know if they will have a satisfactory catch, to the point of being uncertain regarding their livelihoods, is detrimental to their health. In addition, these workers have a seven times higher risk of death compared to all other industrial sectors combined, due to wreckages, inclement weather and the probability of clashing with dangerous aquatic animals, according to the International Labour Organization (ILO, 2000).

Fishing characterization

Regarding the fishing profile (Table 3), most lobstermen (86.19%) learned to fish from relatives. The same pattern by which a family is involved with fishing is a method of transmitting knowledge, as reported by Galdino (1995) and Vieira (2007).

The length of time dedicated to fishing (more than 30 years) demonstrates that these workers have experience and maturity in their profession, making them local experts. More than 41.77% of the respondents surveyed fish three to four days a week. In the fishing community of the municipality of Touros, Rio Grande do Norte, there was greater fishing effort, as 53.49% of the fishermen work every day of the week, 45.35% fish three to five days a week and only 1.16% work one to two days per week (Castro 2013).

Deep-sea fishing (Figure 3) is performed by 64.77% of the lobstermen. The most commonly used gear (70.20%) is the covo or manzuá trap, which has an irregular hexagonal shape, and may have varying sizes. The frame is typically made of marmeleiro, peroba or pau d'arco wood and is covered with nylon or wire mesh. In Touros, only 9.52% of the respondents fish with these traps, and more than half (53.17%) use catch nets (caçoeiras) (Castro 2013).

Some lobstermen use more than one type of fishing gear, and although 24.83% continue to use a compressor, 84.71% report being aware that its use is prohibited by law. They report that they surrendered their compressors, which were worth R\$ 4,000, to IBAMA between 2007 and 2008, and they only received R\$ 1,000 with the promise of additional funding for the construction of covo-type traps. However, because the promise was not fulfilled, they began using compressors again. Both compressors and the caçoeira nets, used by 9.93% of the lobstermen, are prohibited by Brazilian law no. 11959 of 6/29/2009 (Brasil 2009) because these methods are known to be predatory and cause damage to the natural habitat of benthic marine species.

Moran (2010) highlights the difficulty of adapting to changes until the transition process is fully established, which results in lobstermen continuing to implement the practices that persist in the community. The use of legally prohibited gear will continue until lobstermen understand that the environmental pressure suffered by the fished species is not seasonal but permanent.

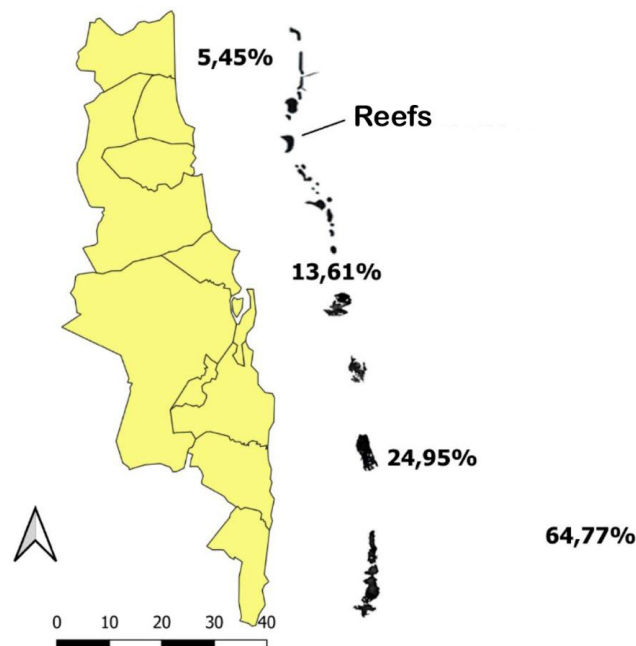
Table 3. Fishing aspects and relative frequency of lobstermen from six coastal municipalities: Baía da Traição, Lucena, Cabedelo, João Pessoa, Conde and Pitimbu, Paraíba (Northeast Brazil).

Fishing data	B. Traição		Lucena		Cabedelo		J. Pessoa		Conde		Pitimbu		Total	
	24	%	9	%	17	%	15	%	12	%	23	%	100	%
Learned to fish with relatives	20	83.33	8	88.89	17	100.00	10	66.67	12	100.00	18	78.26	85	86.19
Learned to fish with fishermen	4	16.67	1	11.11	0	0.00	5	33.33	0	0.00	5	21.74	15	13.81

Fishing data		B. Traição		Lucena		Cabedelo		J. Pessoa		Conde		Pitimbu		Total	
		24	%	9	%	17	%	15	%	12	%	23	%	100	%
Years fishing	1 to 10	0	0.00	0	0.00	0	0.00	3	20.00	0	0.00	0	0.00	3	3.33
	11 to 20	2	8.33	1	11.11	1	5.88	3	20.00	1	8.33	2	8.70	10	10.39
	21 to 30	11	45.83	2	22.22	7	41.18	2	13.33	4	33.33	8	34.78	34	31.78
	31 to 40	8	33.33	2	22.22	7	41.18	4	26.67	5	41.67	8	34.78	34	33.31
	41 to 50	0	0.00	2	22.22	0	0.00	1	6.67	1	8.33	3	13.04	7	8.38
	≥50 years	3	12.50	2	22.22	2	11.76	2	13.33	1	8.33	2	8.70	12	12.81
Days fishing / week	1 to 2	1	4.17	0	0.00	0	0.00	1	6.67	1	8.33	0	0.00	3	3.19
	3 to 4	9	37.50	2	22.22	15	88.24	6	40.00	7	58.33	1	4.35	40	41.77
	5 to 6	13	54.17	2	22.22	2	11.76	5	33.33	3	25.00	22	95.65	47	40.36
	All	1	4.17	5	55.56	0	0.00	3	20.00	1	8.33	0	0.00	10	14.68
Fishing location	Reefs	0	0.00	3	33.33	0	0.00	6	40.00	1	8.33	0	0.00	10	13.61
	Between reef and beach	0	0.00	0	0.00	0	0.00	5	33.33	0	0.00	0	0.00	5	5.56
	Beyond reefs	0	0.00	3	33.33	11	64.71	4	26.67	3	25.00	0	0.00	21	24.95
	Deep sea	24	100.00	3	33.33	6	35.29	8	53.33	8	66.67	23	100.00	72	64.77
Fishing gear	Compressor	11	45.83	0	0.00	10	58.82	1	6.67	4	33.33	1	4.35	27	24.83
	Light source	0	0.00	1	11.11	0	0.00	3	20.00	0	0.00	1	4.35	5	5.91
	Manzuá or covo trap	16	66.67	9	100.00	7	41.18	7	46.67	8	66.67	23	100.00	70	70.20
	Diurnal diving	2	8.33	1	11.11	2	11.76	10	66.67	0	0.00	1	4.35	16	17.04
	Catch net	3	12.50	0	0.00	5	29.41	2	13.33	0	0.00	1	4.35	11	9.93
	Other (line fishing)	1	4.17	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.69
Vessel	Motorboat	24	100.00	9	100.00	17	100.00	12	80.00	12	100.00	22	95.65	96	95.94
	Sailboat	0	0.00	0	0.00	0	0.00	2	13.33	0	0.00	2	8.70	4	3.67
	Rowboat	0	0.00	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	1	1.11
	Swimming	0	0.00	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	1	1.11

Fishing data		B. Traição		Lucena		Cabedelo		J. Pessoa		Conde		Pitimbu		Total	
		24	%	9	%	17	%	15	%	12	%	23	%	100	%
Boat ownership	Sole owner	16	66.67	2	22.22	5	29.41	9	60.00	6	50.00	7	30.43	45	43.12
	Partnership	8	33.33	2	22.22	12	70.59	5	33.33	6	50.00	16	69.57	49	46.51
	Third party	0	0.00	5	55.56	0	0.00	0	0.00	0	0.00	0	0.00	5	9.26
Makes own gear		20	83.33	5	55.56	16	94.12	11	73.33	11	91.67	22	95.65	85	82.28
Does not make own gear		4	16.67	4	44.44	1	5.88	4	26.67	1	8.33	1	4.35	15	17.72
Fishing gear	Net	3	12.50	2	22.22	6	35.29	4	26.67	1	8.33	1	4.35	17	18.23
	Harpoon	12	50.00	0	0.00	10	58.82	10	66.67	5	41.67	1	4.35	38	36.92
	Raft	0	0.00	1	11.11	0	0.00	0	0.00	0	0.00	0	0.00	1	1.85
	Boat sail	0	0.00	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	1	1.11
	<i>Covo/manzuá</i> trap	11	45.83	3	33.33	7	41.18	4	26.67	7	58.33	22	95.65	54	50.17
Know gear prohibited by law		22	91.67	9	100.00	17	100.00	13	86.67	12	100.00	22	95.65	95	95.66
Does not know gear prohibited by law		2	8.33	0	0.00	0	0.00	2	13.33	0	0.00	1	4.35	5	4.34
Prohibited gear	Compressor	22	91.67	6	66.67	17	100.00	12	80.00	11	91.67	18	78.26	86	84.71
	Diving	1	4.17	1	11.11	0	0.00	0	0.00	0	0.00	0	0.00	2	2.55
	<i>Marambaia</i>	0	0.00	1	11.11	1	5.88	0	0.00	1	8.33	4	17.39	7	7.12
	Net	18	75.00	8	88.89	17	100.00	10	66.67	11	91.67	22	95.65	86	86.31
Taught someone how to fish		19	79.17	7	77.78	12	70.59	11	73.33	12	100.00	23	100.00	84	83.48
Never taught anyone how to fish		5	2.83	2	22.22	5	29.41	4	26.67	0	0.00	0	0.00	16	16.52
Closed season is effective		8	33.33	8	88.89	0	0.00	9	60.00	7	58.33	0	0.00	32	40.09
Closed season is ineffective		16	66.67	1	11.11	17	100.00	6	40.00	5	41.67	23	100.00	68	59.91
Why closed season is ineffective	Lack of oversight	15	62.50	0	0.00	6	35.29	6	40.00	1	8.33	14	60.87	42	34.50
	Not everyone receives closed season benefits	2	8.33	0	0.00	7	41.18	0	0.00	3	25.00	1	4.35	13	13.14
	Purchase of fishing license	0	0.00	0	0.00	2	11.76	0	0.00	0	0.00	0	0.00	2	1.96
	Not observed	0	0.00	0	0.00	2	11.76	0	0.00	1	8.33	9	39.13	12	9.87
Other		0	0.00	1	11.11	0	0.00	0	0.00	0	0.00	0	0.00	1	1.85

Figure 3. Localization of lobster fishing areas in Paraíba, Northeast of Brazil.



With the objective of implementing other fishing methods in place of the prohibited use of compressors and *caçoeira* nets, lobstermen began to submerge *marambaias*, which are typically made from metal chemical drums, at sea to create artificial hiding structures used as lobster burrows (Castro et al. 2012).

Several respondents reported the use of *marambaias* by other lobstermen. They claim that this gear makes fishing much more predatory than use of a compressor ever did because, in addition to attracting more lobsters in search of shelter from predators, the material contaminates the water and marine animals around it as it oxidizes in its permanently submerged state. Moreover, some *marambaias* are already contaminated with toxic substances because they store chemicals. Given such a situation, Moran (2010) reports that for each adjustment considered successful, there are consequences in other spheres. Due to the aggressive nature of catching, lobster fishing has long been overexploited (Phillips and Merville-Smith 2006).

Only 43.12% of the respondents owned their own boat; the majority (46.51%) fished using a collectively owned boat. Regarding the type of propulsion, 95.94% used a motorboat. Vieira (2007) also observed that only 32.2% of fishermen in Frexeiras owned their own boats. Most lobstermen reported that they participate in a partnership or use third-party boats because they cannot afford to buy their own boat; in addition, most are related to the boat's owner.

The studies by Maldonado (1993) and Cordell (2001) indicate that work relationships between family members benefit from mutual collaboration, helping to reduce likely conflicts and interpersonal disagreements, which complicate daily decisions and the performance of fishing activities. In addition, such relationships ensure food security among relatives.

Most lobstermen construct their own fishing gear (82.28%), the majority of which are *covo/manzuá* traps (50.17%). Gear-making also involves family members, mostly children, in addition to the lobstermen themselves. The domestic construction of fishing gear also occurs in other communities (Vieira 2007).

Given the age range of the lobstermen (20 to over 60 years old) and that 83.48% of lobstermen have taught somebody to fish, the activity is therefore performed by different generations. Thus, there is a transfer of knowledge that is passed from adult to child. On the coast of São Paulo, artisanal fishing techniques are taught to young people, thus transmitting knowledge of the activity’s practices to different generations (Clauzet et al. 2005).

When asked about the closed season in the state of Paraíba, 59.91% reported that the operation is not effective, with 34.50% reporting that the reason is a lack of oversight and 13.14% reporting that not everyone receives the closed season benefit. Therefore, fishing continues during this prohibited period. Vieira (2007) also found that 83.9% of fishermen in Flexeiras claim that there are no inspections during the closed season. Despite a lack of oversight, the report that not everyone receives the closed season benefit is also important because, according to the respondents, the “owners of the licenses” collect approximately half of the benefit from each lobsterman, and if they do not pay, in the following year they will not be permitted use of the license owner’s fishing vessel.

According to Mendonça and Pereira (2013), the closed season benefit policy (law no. 10779 of 11/25/2003, Brasil, 2003) established in 2003 and reformulated in 2009 by the new fishing law (law no. 11959 of 6/29/2009, Brasil, 2009) proposes to protect the reproduction and/or recruitment of species by complying with the closed season policy and ensuring a satisfactory income for the fisherman during this period.

Regarding the fishing profile (Table 4), the number of lobsters caught, 85.85% reported that they catch many lobsters, and 100% agree that lobster is easy to sell. The majority, 74.29%, sell to intermediates, which represent a commercial link between artisanal lobstermen and the consumer market, the former purchasing the product at a low cost and then pass it on to the latter at a much higher price. Because lobstermen cannot typically store their catch they choose to sell to intermediaries. Thus, lobstermen are exploited and earn a minimal share of the sale of their product, even though acquiring the product involved substantial effort (Castro and Oliveira 2011).

Table 4. Fishing aspects and relative frequency of lobstermen from six coastal municipalities: Baía da Traição, Lucena, Cabedelo, João Pessoa, Conde and Pitimbu, Paraíba (Northeast Brazil).

Fishing Data	B. Traição		Lucena		Cabedelo		J. Pessoa		Conde		Pitimbu		Total	
	24	%	9	%	17	%	15	%	12	%	23	%	100	%
Closed season is effective	8	33.33	8	88.89	0	0.00	9	60.00	7	58.33	0	0.00	32	40.09
Closed season is ineffective	16	66.67	1	11.11	17	100.00	6	40.00	5	41.67	23	100.00	68	59.91
Why closed season is ineffective														
Lack of oversight	15	62.50	0	0.00	6	35.29	6	40.00	1	8.33	14	60.87	42	34.50
Not everyone receives closed season benefits	2	8.33	0	0.00	7	41.18	0	0.00	3	25.00	1	4.35	13	13.14
Purchase of fishing license	0	0.00	0	0.00	2	11.76	0	0.00	0	0.00	0	0.00	2	1.96
Not observed	0	0.00	0	0.00	2	11.76	0	0.00	1	8.33	9	39.13	12	9.87
Other	0	0.00	1	11.11	0	0.00	0	0.00	0	0.00	0	0.00	1	1.85

Catches many lobster		20	83.33	7	77.78	17	100.00	10	66.67	11	91.67	22	95.65	87	85.85
Does not catch many lobster		4	16.67	2	22.22	0	0.00	5	33.33	1	8.33	1	4.35	13	14.15
Sells the lobster		24	100.00	9	100.00	17	100.00	14	93.33	12	100.00	23	100.00	99	98.89
Consumes the lobster		3	12.50	1	11.11	0	0.00	8	53.33	0	0.00	0	0.00	12	12.82
Who sells lobster?	Boat owner or entrepreneur	4	16.67	5	55.56	2	11.76	1	6.67	0	0.00	0	0.00	12	15.11
	Intermediaries	19	79.17	3	33.33	15	88.24	8	53.33	11	91.67	23	100.00	79	74.29
	Merchants or market stallholders	0	0.00	0	0.00	0	0.00	1	6.67	1	8.33	0	0.00	2	2.50
	Sells directly to the consumer	1	4.17	1	11.11	0	0.00	6	40.00	0	0.00	0	0.00	8	9.21
	Sells to bars and restaurants	0	0.00	1	11.11	0	0.00	2	13.33	0	0.00	0	0.00	3	4.07
Only sells, does not use for anything else		20	83.33	9	100.00	15	88.24	14	93.33	7	58.33	19	82.61	84	84.31
Makes crafts with the lobster		4	16.67	0	0.00	2	11.76	1	6.67	5	41.67	4	17.39	16	15.69
Major fished species	<i>Panulirus argus</i>	22	91.67	8	88.89	8	47.06	14	93.33	9	75.00	23	100.00	84	82.66
	<i>Panulirus laevicauda</i>	24	100.00	9	100.00	17	100.00	15	100.00	12	100.00	22	95.65	99	99.28
	<i>Panulirus echinatus</i>	4	16.67	3	33.33	9	52.94	9	60.00	3	25.00	0	0.00	28	31.32
	<i>Parribacus antacticus</i>	2	8.33	1	11.11	0	0.00	1	6.67	0	0.00	0	0.00	4	4.35
	<i>Scyllarides brasiliensis</i>	3	12.50	3	33.33	0	0.00	1	6.67	0	0.00	0	0.00	7	8.75
Preferred catch	No preference	1	4.17	1	11.11	1	5.88	2	13.33	0	0.00	0	0.00	5	5.75
	<i>Panulirus echinatus</i>	0	0.00	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	1	1.11
	<i>Panulirus argus</i>	23	95.83	5	55.56	7	41.18	10	66.67	9	75.00	23	100.00	77	72.37
	<i>Panulirus laevicauda</i>	0	0.00	3	33.33	9	52.94	2	13.33	3	25.00	0	0.00	17	20.77
Why preferred	Yields more	22	91.67	7	77.78	10	58.82	10	66.67	9	75.00	23	100.00	81	78.32
	Easier and higher quantity	1	4.17	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	2	1.81
	Found in reefs	0	0.00	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	1	1.11
	All types are the same	1	4.17	0	0.00	1	5.88	2	13.33	0	0.00	0	0.00	4	3.90
	Tastier	0	0.00	2	22.22	6	35.29	1	6.67	3	25.00	0	0.00	12	14.86
Fishing influenced by moon	Not influenced	13	54.17	2	22.22	4	23.53	3	20.00	3	25.00	7	30.43	32	29.23
	New moon	6	25.00	6	66.67	13	76.47	6	40.00	9	75.00	16	69.57	56	58.78
	Full moon	2	8.33	0	0.00	0	0.00	7	46.67	1	8.33	1	4.35	11	11.28
	Crescent moon	4	16.67	1	11.11	0	0.00	0	0.00	0	0.00	0	0.00	5	4.63
	Waning moon	5	20.83	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	6	4.58

	Summer	16	66.67	7	77.78	15	88.24	13	86.67	12	100.00	23	100.00	86	86.56
Time of greatest catch	Spring	0	0.00	0	0.00	1	5.88	1	6.67	0	0.00	0	0.00	2	2.09
	Autumn	1	4.17	1	11.11	1	5.88	0	0.00	0	0.00	0	0.00	3	3.53
	Winter	6	25.00	1	11.11	0	0.00	0	0.00	0	0.00	0	0.00	7	6.02
	Same year round	1	4.17	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	2	1.81
Decreased number of lobsters caught		24	100.00	9	100.00	17	100.00	15	100.00	12	100.00	23	100.00	100	100.00
Reason for decrease	Predatory fishing	21	87.50	9	100.00	3	17.65	14	93.33	8	66.67	19	82.61	74	74.63
	Industrial fishing	1	4.17	0	0.00	12	70.59	0	0.00	4	33.33	2	8.70	19	19.46
	Lack of respect for laws	1	4.17	0	0.00	0	0.00	0	0.00	0	0.00	1	4.35	2	1.42
	Pollution	0	0.00	0	0.00	2	11.76	0	0.00	0	0.00	0	0.00	2	1.96
	Climate change	0	0.00	0	0.00	0	0.00	1	6.67	0	0.00	1	4.35	2	1.84
	Unknown	1	4.17	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.69
Lobster is easy to sell		24	100.00	9	100.00	17	100.00	15	100.00	12	100.00	23	100.00	100	100.00
It is possible to live off of lobster fishing alone		21	87.50	6	66.67	16	94.12	10	66.67	11	91.67	23	100.00	87	84.44
It is not possible to live off of lobster fishing alone		3	12.50	3	33.33	1	5.88	5	33.33	1	8.33	0	0.00	13	15.56
Would like to breed lobster in captivity		23	95.83	8	88.89	17	100.00	14	93.33	12	100.00	23	100.00	97	96.34
Would not like to breed lobster in captivity		1	4.17	1	11.11	0	0.00	1	6.67	0	0.00	0	0.00	3	3.66
Why breeding lobster would be good	Increase in income	12	50.00	2	22.22	2	11.76	8	53.33	2	16.67	3	13.04	29	27.84
	Could produce more than fishing alone	5	20.83	3	33.33	9	52.94	1	6.67	6	50.00	10	43.48	34	34.54
	Easier than fishing	4	16.67	3	33.33	5	29.41	3	20.00	2	16.67	9	39.13	26	25.87
	Not dependent on weather conditions	5	20.83	0	0.00	1	5.88	1	6.67	2	16.67	1	4.35	10	9.07
	Conservation	0	0.00	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	1	1.11
Want to be informed about culture techniques		23	95.83	8	88.89	17	100.00	15	100.00	12	100.00	23	100.00	98	97.45
Does not want to be informed about culture techniques		1	4.17	1	11.11	0	0.00	0	0.00	0	0.00	0	0.00	2	2.55
Interested in experimental culture		23	95.83	8	88.89	17	100.00	14	93.33	12	100.00	23	100.00	97	96.34
Not interested in experimental culture		1	4.17	1	11.11	0	0.00	1	6.67	0	0.00	0	0.00	3	3.66

Of the 98.89% of the lobstermen that sell the lobsters they catch, 15.69% of these also make lobster shell handicrafts to earn additional income, and 84.44% claim that they can make a living from lobster fishing alone.

Regarding the main species caught, 99.28% are *Panulirus laevicauda*, 82.66% are *Panulirus argus*, 31.32% are *Panulirus echinatus*, 8.75% are *Scyllarides brasiliensis* and 4.35% are *Parribacis antacticus*. Most lobstermen (72.37%) prefer to catch *P. argus*, and 78.32% state that this lobster yields more profit due to its size.

The moon and the tides have a strong influence on fishing, and 58.78% state that the new moon yields the best catch because the lobster does not see the trap or net, entering the device or becoming ensnared. Regarding the best time of year to catch lobster, 86.56% say it is summer because the water is clear and there is not much wind, although this coincides with the closed season.

All lobstermen agreed that overall catch has decreased over time, and 74.63% claim that predatory fishing is the primary reason. The same was observed in a study conducted in the community of Touros, in which Castro (2013) observed in a report of the local fishermen a disdain for fishing, given that fish stocks, especially lobster, decreased in quantity and quality, not resembling historic catches. This caused a reduction in income and a consequent increase in catch effort to ensure the maintenance of fishermen's families.

When questioned about the possibility of participating in a lobster captive breeding project, 96.34% answered affirmatively, with 34.54% stating that this would be more productive than fishing and 27.84% reported the benefit of increased income. Thus, 97.45% want to be informed about culture techniques, and 96.34% are interested in experimental culture.

Conclusions

The artisanal lobstermen who catch lobsters in Paraíba are experienced adults. We found very few young people who were involved in fishing.

Lobstermen earn approximately three times the minimum wage during the six months that fishing is permitted, an amount that may vary according to the weather conditions and how many days they fish, with a large portion of their income complemented by other activities.

The main gear used by lobstermen is the covo/manzuá trap, and most make their own fishing gear. The lobstermen are aware that some techniques used for catching lobsters are prohibited by law and contribute directly to reducing stocks. Thus, if these forms of capture continue to be practised, local stocks, some of which are already over-exploited, may be further compromised in the future, resulting in socioeconomic and environmental consequences in the communities that depend on fishing.

Most lobstermen disregard the fishing laws because they recognize the inefficacy of the closed season, which they attribute to a lack of governmental oversight. The lack of participative management in the commercialization process results in lobster prices being determined by intermediaries, who, according to the lobstermen, are the group who profit most from the commercialization of this resource.

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Compliance with ethical standards and other licences: This research was approved by the Research Ethics Committee of the State University of Paraíba (PROTOCOL: 0339/15, CAAE: 45785315.5.0000.5188). The authors interviewed informants, who were informed of the aim of this scientific research and agreed to sign an informed consent form, according to necessary standards (Resolution 466/12).

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