# THE MACROECONOMIC AND LOCAL CONTRIBUTION OF SPORT AND CHARTER FISHING IN COSTA RICA

FECOP
FEDERACIÓN COSTARRICENSE DE PESCA


"The voice of sportfishing"

# AUTHORS

Adriana Chacón Cascante
Henry Marín Sandoval

February, 2019

# ABOUT THIS DOCUMENT

During 2018 the Costa Rican Fishing Federation conducted two research projects on the impact of the activity at macroeconomic and local levels. Both were possible thanks to the support of the sector (marinas, captains, hotels, first mate, among others) in the data collection process.

The first part of this document presents a compilation and analysis of some macroeconomic data on sport and charter fishing in Costa Rica. The second part presents an analysis derived from the investigation of seven communities of importance for this activity, where the focus of the analysis is on the quality and livelihood of the population working in this economic sector.

We appreciate the participation of those who were involved, both in the collection of data in the communities by our interviewers Mariano Barrantes and Yerling Villalobos, as well as all the people in the sport and charter fishing sector who provided us with valuable information.

# CONTENTS

## CONTENT

## CONTENT

# THE IMPACT OF SPORT FISHING AND CHARTER FISHING AT THE MACROECONOMIC LEVEL

# INTRODUCTION

Sport and charter fishing have an economic impact through its direct relationship with other highly dynamic productive activities, such as tourism and the fishing sector itself. Both sectors maintain commercial relations or backward and forward linkages with other sectors, which generates a multiplying effect on the impact of sport and charter fishing on the economy. That is, this activity not only generates income for people directly linked to it, but also does so through related sectors.

Previous studies have estimated the contribution of sport and charter fishing to the national economy; However, the existing evaluations must be updated and validated. For instance, the need to exclude expense items associated with the activity (sport and charter fishing) that are not perceived by costarican stakeholders, such as purchases made from international operators by foreign tourists before making the fishing trip to the country. Within this category of expenses stands out the purchase of airline tickets.

The estimates presented in this document consider those identified limitations, and although they are of a preliminary nature, their scope depends directly on the existence of specific information for the activity, which is quite scarce, and, also, on the availability of updated statistics.

The purpose of the analysis is to make a general estimate of the contribution of sport and charter fishing to the national economy. The analysis complements the results obtained through the case studies that were conducted at the community level as part of the same consultancy.

The second section details the methodology used for the analysis. The first part analyzes more complex studies previously conducted, with the aim of generating a preliminary methodological framework for a more thorough analysis desired to be made in the

near future on the subject in question. In the methodology section, the information used for this analysis is also described, as well as the way it was analyzed. Finally, the third section shows the results and discussion.

# METHODOLOGICAL DESIGN

As part of the activities to define the methodology to be used in the quantification of the contribution of sport and charter fishing to the national economy (macroeconomic contribution), the possibility of replicating the study titled *An analysis of the economic contribution of the commercial sport and charter fishing to Costa Rican economy*, prepared by the Institute of Economic Research of the University of Costa Rica and the Billfish Foundation, was considered.

Due to the complexity of this analysis and considering the resources available to carry out this study, it was decided to use a simpler methodology. However, in view of the interest in conducting a more thorough study in the near future, similar to that made by the UCR, a general summary of the methodologies and information sources necessary to replicate said task was included as part of this report.

To carry out the study, four different econometric models were used, which are fed from primary and secondary information sources. The collection of primary information was based on three surveys, one of them applied in the US and the other two in CR. For secondary information, at least three different sources were used, as detailed below.

The econometric models used were as follows:

1. Disaggregation of the Gross Domestic Product (GDP) to quantify the contribution of the activity to the national economic aggregates.

2. Employment model to measure the total productivity of factors and thus estimate the contribution of sport and charter fishing in the labor market.

3. General equilibrium model, which allows to analyze the macro-economic relations of sport and charter fishing with the other sectors of the economy.

4. Value chain model to analyze microeconomic relationships of the sector with the other sectors of the economy.

For later studies, one of the challenges is to obtain accurate data that will allow to break down the macroeconomic aggregates associated with tourism and, to a lesser extent, the fishing sector in order to estimate, in a more rigorous manner, the percentage of the contribution made by sport and charter fishing through its economic relations with both sectors.

Such disaggregation would be possible through the use of a general equilibrium model, as was done in the UCR study. In this case, a model defined by the researchers who participated in the study was used, a methodology that is highly demanding both in terms of time and resources, as it requires estimates of specific parameters for each sector.

It is proposed, as an alternative for future studies, to use the GTAP (Global Trade Analysis Project) model of the Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, Global Economic Analysis, which allows to customize the analysis at the country level by parameterizing key variables according to the user needs.

The use of a model already defined and validated, such as the GTAP, would save time, while ensuring the validity of the results, as it is a model validated worldwide through its application in various productive sectors.

The analysis of the labor market (employment) was done through a productivity model of production factors. This methodology is, like

the previous one, highly resource-demanding, so it is proposed, as an alternative for future studies, the use of secondary information that allows to estimate the number of direct jobs generated by sport and charter fishing. If possible, it is proposed that this information be complemented with the analysis of linkages of the activity with other sectors of the economy, in order to estimate the amount of indirect jobs generated.

As mentioned above, the UCR study collected primary information from three different surveys:

1. Tourists. Profile and expenses of tourists who travel for the purpose of sport and charter fishing in Costa Rica. For two months, a survey was applied to tourists from the United States and Canada at the Juan Santamaría and the Daniel Oduber airports in Alajuela and Liberia, respectively.

If there are available resources, it is recommended to use a similar survey because the existing data do not allow an accurate characterization of the profile of the people who practice sport and charter fishing. There is a study conducted by the CIMAT-ICT that estimates the labor impact of the La Marina Los Sueños operation, assesses the profile of the tourists drawn by sport and charter fishing and details many of the variables necessary for the analysis desired to be performed (CIMAT / ICT, 2011). However, because it is a specific analysis for La Marina Los Sueños, the results are not representative of the population that practices sport and charter fishing and, therefore, cannot be extrapolated for a nationwide analysis.

2. *On-site* survey for hotels and companies that provide sport and charter fishing services to establishments in the Caribbean, Central Pacific, South Pacific and North Pacific zones.

The purpose of this survey is to obtain more accurate information on the use of tourism income in hotels and commercial establishments. It is also recommended to apply a survey of this type to gather the necessary information to estimate the contribution of sport and charter fishing at the community level for support activities, such as accommodation and food.

3. As a complement to the information obtained from the two previous surveys, the IICE designed a survey for experts related to the activity in Costa Rica.

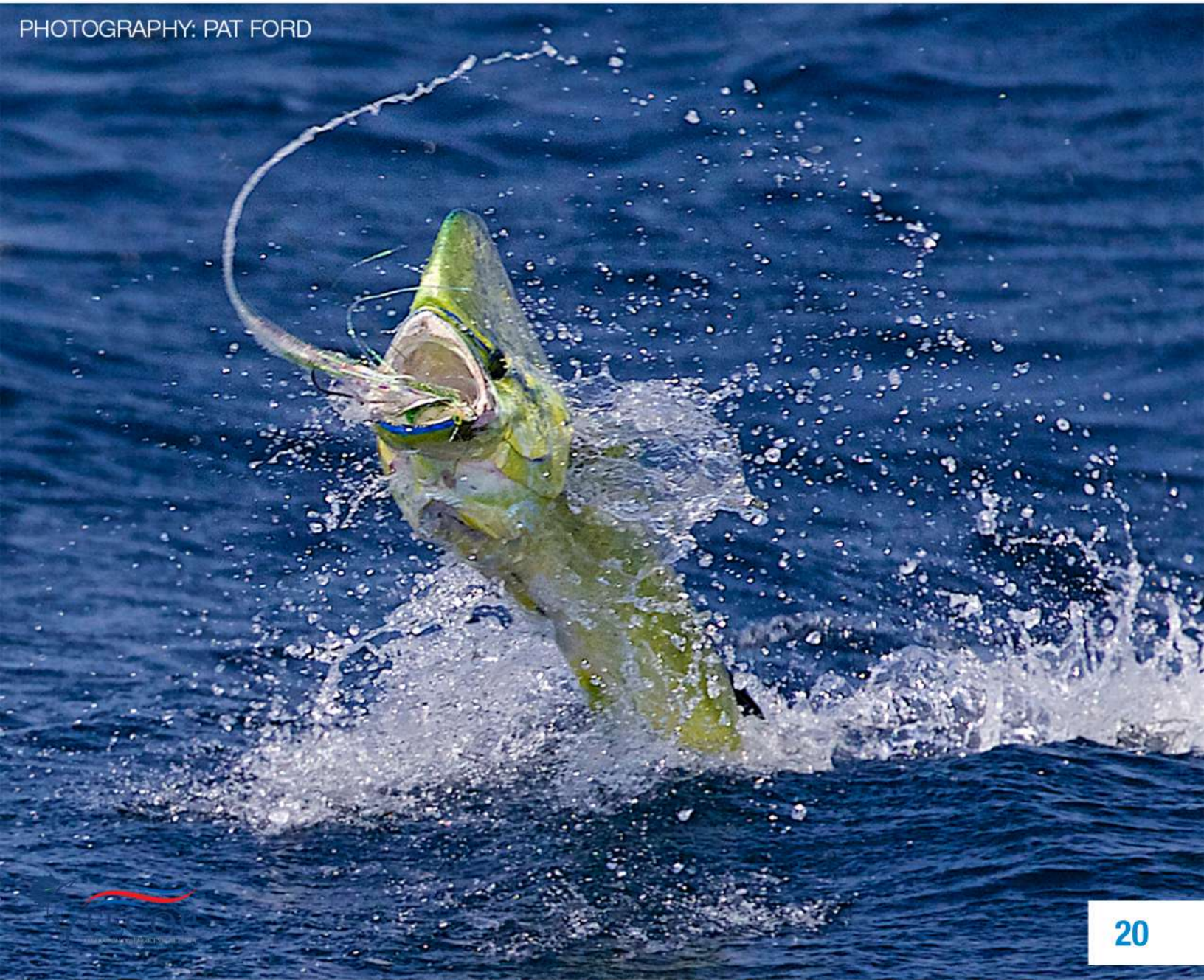

PHOTOGRAPHY: PAT FORD

Figure 1 shows the variables on which the study for the analysis of the macroeconomic impact of sport and charter fishing in CR was based. Access to data that quantified the number of jobs generated by the activity, the amount of direct income generated, the linkages with the tourism sector and the investment in capital was sought.

Macro impact


Figure 1. Macroeconomic impact of sport and charter fishing
Source: Own elaboration, 2018

Information was requested from the national institutions. Each of these entities was asked for statistics of the variables indicated. The amount of information available was less than expected; It is important to highlight that the process of collecting the information

was in charge of FECOP. Then the information collected was complemented with statistics from the World Tourism Organization (WTO, 2018).

The indicators shown in Table 1 were estimated from the information collected. Below is an explanation of the steps followed to estimate each one[1].

**Chart 1**
Indicators built for analysis

| Macroeconomic sector | Indicator |
|---|---|
| Direct income | Expenditure per boat. |
| Tourism | Number of tourists doing sport and charter fishing. |
| | Distribution of expenditure in other tourism sectors. |
| | Total expenditure of tourists on sport and charter fishing in Costa Rica. |
| | Contribution of tourism and sport and tourism fishing in relation to the total national tourism. |
| | Characteristics of the regular tourist compared to the sport and charter fishing tourist. |

**Source:** Own elaboration, 2018

[1] It was not possible to have access to information that would allow to make estimates at the level of two of the previously unidentified impact dimensions: employment and capital investment.

## INCOME FROM SALARY

For the study at the community level, information was collected on the salary reported by people working in sport and charter fishing vessels. This information will be the basis for the income estimates generated by this activity.

## MAINTENANCE OF VESSELS

There are two sources of information on the cost of annual maintenance of sport and charter fishing vessels. The first source was generated by CIMAT (2011), and focuses on vessels located in the Marina Los Sueños. The second source was generated by FECOP, in 2015, from a study conducted in Golfo Dulce. For the purposes of the calculation, both data were used because there is no information available at the country level.

With the purpose of converting the amounts estimated by both sources and making them comparable with the other data, the different items of expenditure that make up the maintenance cost of vessels were converted to 2017 values. To ensure the greatest possible accuracy of the estimates, the different cost items (of this category) were deflated with differentiated indices, as detailed in Table 5.

The fuel was deflated using the fuel prices for fishermen reported by RECOPE (2018). Note that between 2011 and 2017 the average cost of diesel for fishermen decreased by 24%, while for the period 2015-2017 the average cost of this fuel increased approximately 3.5%.

The salaries of the captain and crew were deflated using the nominal minimum wage index. Repair and maintenance, accessories, furniture, and other costs were updated to 2017 values through the consumer price index. The insurance and tax and marina items were assumed constant.

**Chart 2**

Price variations for the 2011-2017 and 2015-2017 periods

| | 2011-2017 | 2015-2017 | Source |
|---|---|---|---|
| Fuel | -24.04 % | 3.49 % | Recope. Price of fuels for fishermen. |
| Captain and crew | 26.54 % | 2.36 % | BCC. Index of nominal minimum wages. |
| Repair and maintenance | 15.89 % | 3.34 % | BCC. Consumer's price index. |
| Accessories, furniture | 15.89 % | 3.34 % | |
| Other | 15.89 % | 3.34 % | |
| Insurance and taxes | 0.00 % | 0.00 % | It is assumed that there is no variation. |
| Marina costs | 0.00 % | 0.00 % | |

**Source:** Own elaboration, 2018

The estimate of the income generated by sport and charter fishing in the tourism sector was based on statistics from the Costa Rican Tourism Institute (ICT; 2017), CIMAT-ICT (2011) and the World Tourism Organization (WTO) (2017). These data were combined to estimate the income generated by sport and charter fishing in 2017.

For this estimate, the following assumptions and calculations were made:

1. In 2017, 153,913 people came to practice sport and charter fishing. This figure was obtained from the statistics of the ICT (2018), according to which a total of 2,959,868 people entered the country that year, of which 5.2% reported sport and charter fishing as the reason for the trip.

2. According to data for 2017 of the WTO (2018), the average expenditure per foreign tourist was $ 3,206 (14% lower than the average expenditure of all foreign visitors regardless of the purpose of their trip).

3. According to data from the Interinstitutional Commission of Marinas and Tourist Docks (CIMAT, 2011), the average expenditure per person visiting the country to practice sport and charter fishing amounts to $ 3,918, with differences depending on the port of entry. Tourists who enter through the Juan Santamaría airport spend an average of $4,825, while those who travel to the Liberia airport report an average expenditure of $3,412.

These data are considered representative of the maximum expenditure observed among tourists who visit the country with the purpose of practicing sport and charter fishing, since the study from which this information was taken focuses only on tourists who visit

the Marina Los Sueños. The profile of this visitor is the one with the highest level of income.

4. According to the study conducted by CIMAT (2011), the total expenditure of sport and charter fishing tourists in the national territory is distributed as follows:

**Chart 3**
Percentage distribution of the average total spending on sport and charter fishing trips to the Marina Los Sueños, Costa Rica, 2011 (%)

| Expense item | General average | Juan Santamaría | Liberia |
|---|---|---|---|
| Transportation | 40.81 % | 41.93 % | 37.43 % |
| Lodging | 42.70 % | 28.15 % | 56.15 % |
| Others related to sport and charter fishing | 9.80 % | 22.26 % | 0.82 % |
| Other expenses | 6.69 % | 7.67 % | 5.60 % |
| Total expenses in CR | 100 % | 100 % | 100% |

Own elaboration from research conducted by IICE-UCR (2011)

5. This information was used to estimate the expenditure in each item for 2017, based on the average expenditure per visitor reported by the ICT (2018).


PHOTOGRAPHY: PAT FORD

# RESULTS

## INCOME FROM SALARY

According to these data, in 2018, 249 people who work in sport and charter fishing vessels earned a total of $ 468,370 from salaries. The community where most income is reported for this activity is Herradura with 26% of the total, followed by El Coco (15%), Golfito and Tamarindo (each with 13%), Puerto Jiménez (11%), Quepos (8%) and Flamingo (4%).

In view of the fact that there is no census to determine the total number of people who work in sport and charter fishing vessels in the country, it is not possible to estimate the total income generated from salaries. However, the available data show the impact of the activity (sport and charter fishing) in the communities.

**Chart 4**

Income generated from work on fishing vessels reported by the people surveyed by FECOP to assess the impact of sport and charter fishing

| | Average income ($) | Total income generated ($) | % | Observations (N) | Variance ($) | Minimum ($) | Maximum ($) |
|---|---|---|---|---|---|---|---|
| Herradura | 2,222 | 122,200 | 26 | 55 | 2,398,682 | 250 | 10,000 |
| El Coco | 1,551 | 71,350 | 15 | 46 | 3,955,388 | 400 | 10,000 |
| Golfito | 1,934 | 59,945 | 13 | 31 | 3,641,963 | 200 | 8,000 |
| Tamarindo | 1,751 | 61,300 | 13 | 35 | 3,647,448 | 250 | 8,800 |
| Puerto Jiménez | 1,433 | 51,600 | 11 | 36 | 1,125,714 | 200 | 5,000 |
| Quepos | 2,461 | 83,675 | 8 | 34 | 5,573,378 | 500 | 1,000 |
| Flamingo | 1,525 | 18,300 | 4 | 12 | 789,318 | 400 | 3,500 |
| Total | | 468,370 | 100 | 249 | | | |

**Source:** Own elaboration based on data from the socioeconomic survey conducted by FECOP, 2018.

The survey also collected data on the average wage per occupation in sport and charter fishing vessels. The results highlight the difference between the wages earned by the owners of the boats, even more so if, in addition, they perform as captain.

**Chart 5**
Income generated from work on fishing vessels reported by the people surveyed by FECOP to assess the impact of sport and charter fishing

| Occupation | Average | N | Stand. Dev. (S) | Minimum ($) | Maximum ($) |
|---|---|---|---|---|---|
| Owner and captain or first mate | 3,800 | 5 | 3,824 | 1,000 | 10,000 |
| Owner | 2,287 | 15 | 2,348 | 600 | 10,000 |
| Captain | 2,124 | 120 | 1,881 | 200 | 10,000 |
| First mate | 1,443 | 69 | 1,079 | 250 | 6,500 |
| Captain and first mate | 1,431 | 16 | 1,429 | 300 | 4,500 |
| NR | 1,689 | 25 | 2,039 | 400 | 11,000 |

**Source:** Own elaboration based on data from the socioeconomic survey conducted by FECOP, 2018.

The total income from wages generated by sport and charter fishing can be estimated once there are statistics of the number of people who participate in the activity. This is a somewhat ambitious task since the national statistics make no difference between sport and charter fishing and other related activities, such as artisanal, commercial and tourism fishing.

Another source of income from sport and charter fishing is through its linkages with support services, such as lodging and food or sale of inputs. There are no data to approximate this information; Nevertheless, from the socioeconomic survey carried out by FECOP in 2018, it was observed that 7.5% of the members who make up the family group of respondents report the wages resulting from the provision of services related sport and tourism fishing as the main source of income.

## VESSEL MAINTENANCE

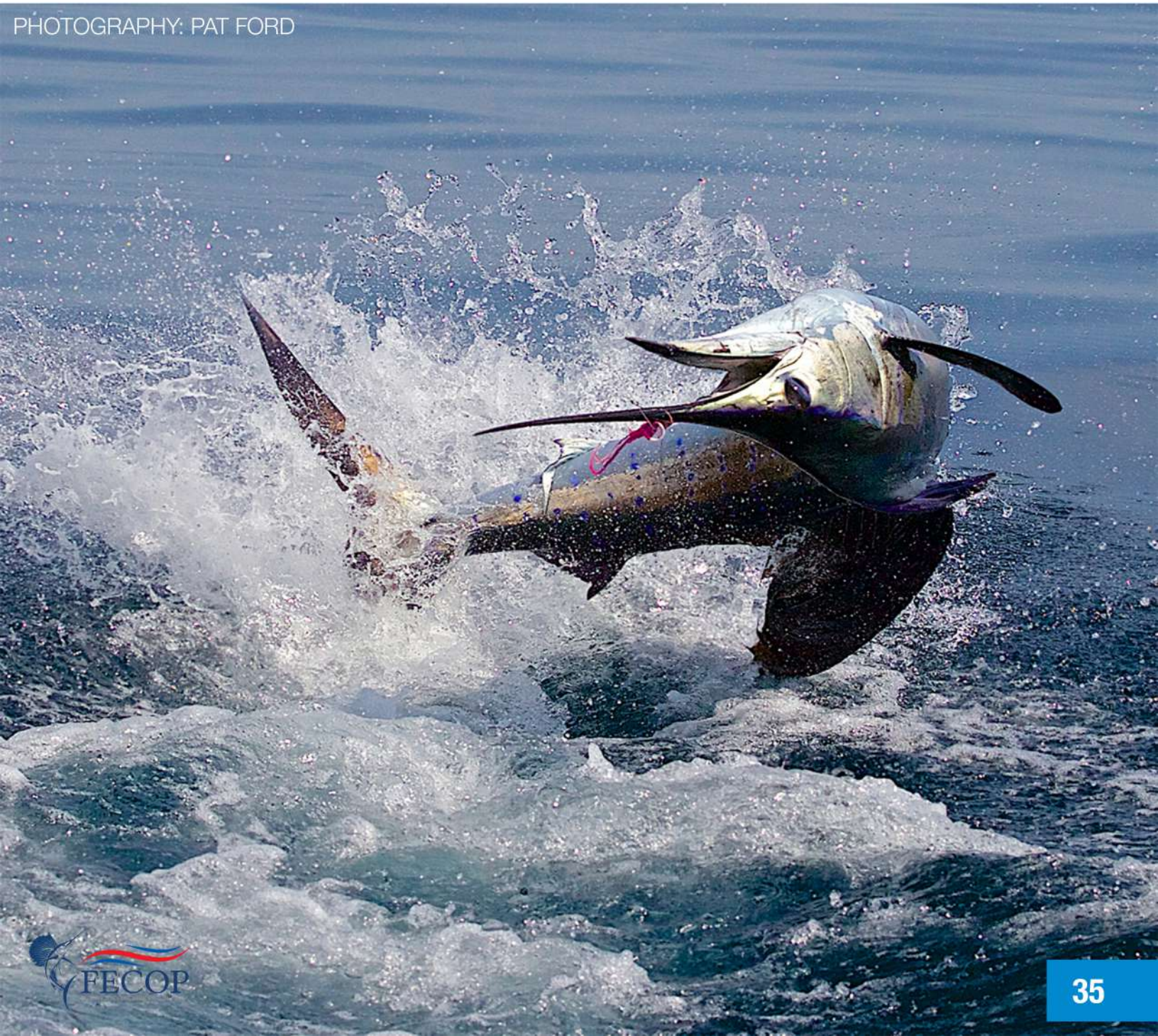
Chart 6 details the cost structure according to data collected from FECOP and CIMAT updated to 2017. Both sources of information agree that the costs of fuel and personnel (captain and crew) are the most important ones in the total cost of maintenance of vessels. Significant differences are observed in the cost of repair and maintenance and in the cost of the marina, which is to be expected given that the costs estimated by CIMAT are for the Marina Los Sueños, where large and luxury vessels prevail.

**Chart 6**
Structure of maintenance costs per vessel

| Item | CIMAT | | FECOP | |
|---|---|---|---|---|
| | % | US$ | % | US$ |
| Fuel | 24.8 | 19,398 | 35.9 | 29,348 |
| Captain and crew | 28.6 | 37,251 | 32.8 | 26,481 |
| Repair and maintenance | 15.9 | 18,977 | 5.2 | 4,249 |
| Accessories, furniture | 5.2 | 6,158 | 2.9 | 2,333 |
| Insurance and taxes | 7.5 | 7,700 | 8.1 | 6,409 |
| Marina costs | 17.7 | 18,288 | 1.2 | 939 |
| Other | 0.4 | 483 | 13.9 | 11,305 |
| Total per vessel | | 108,256 | | 81,065 |

Own elaboration from information of IICE-UCR and TBF and FECOP (2015).

The maintenance cost estimated by CIMAT is used as the maximum limit of this item, while that of FECOP is considered representative of the national average. Considering that the fleet of national sport and charter fishing is of 668 vessels (FECOP, according to the registry of licensed vessels in INCOPESCA), it is estimated that the maintenance of this fleet generates annual income between $ 54.2 and $ 72.3 million.



PHOTOGRAPHY: PAT FORD

Estimates made indicate that the sport and charter fishing activity generates a total income of $ 460.4 million, distributed as follows:

- Transportation: $ 201.4 million
- Lodging: $ 210.7 million
- Other expenses associated with sport and charter fishing: $ 48.4 million

94% of the expenses incurred internally by sport and charter fishing visitors correspond to the tourism sector (Figure 2). The remaining 6% corresponds to income generated to other unspecified sectors of the economy ($ 33 million) (Figure 2).

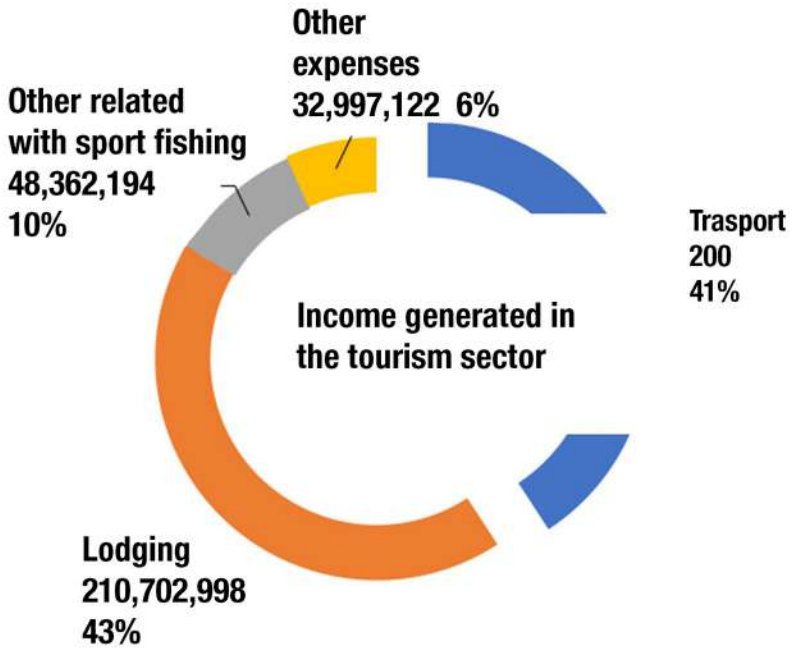



Figure 2. Distribution of expenditure generated by the sport and charter fishing activity (2017)
Source: Own elaboration based on data from ICT (2018) and CIMAT (2011)

## TOTAL INCOME

The annual estimated income generated by sport and charter fishing focuses on crew salaries, tourism and maintenance of vessels. Although there are data on average salaries for the different categories of workers on sport and charter fishing vessels for seven different communities, it is not possible to estimate the total remuneration because there is no data on how many people are engaged in the activity. However, we have an estimate of this data obtained from the maintenance costs of the existing fleet. It can be said, then, that the sport and charter fishing activity generates an annual income between $ 499.7 and $ 520.51 million.

It is important to bear in mind that this estimate does not consider other sources of income generated by the sport and charter fishing activity. Among them, stands out the income to the government for fishing licenses.

In addition, although it was possible to estimate the income from salary produced for working on the vessels of the national sport and charter fishing fleet, it is essential to know the generation of jobs derived from this activity. In this way, we could analyze more thoroughly the characteristics of the families that benefit from it. Also, the estimate does not include the annual capital investment in the sector.

**Chart 7**
Costa Rica: Total income generated by sport and charter fishing nationwide (millions of US $)

| Item | Maximum | Average |
|---|---|---|
| Wages of workers on vessels | 56.93 | 12.75 |
| Income generated in the tourism sector | 460.4 | 460.4 |
| Income from maintenance of vessels | 47.43 | 36.46 |
| Total | 520.51 | 499.7 |

**Source:** Own elaboration based on information from IICE-UCR and TBF and FECOP (2015)

The contribution of sport and charter fishing to the tourism sector is 89%, followed by maintenance of vessels with 9% and workers' salaries on vessels with 2% of the total.

FECOP

# THE IMPACT OF SPORT AND CHARTER FISHING IN SEVEN COSTA RICAN COMMUNITIES

# INTRODUCTION

Costa Rica is a country whose tourism industry is of high importance for its GDP and local development, according to information from the Costa Rican Tourism Institute (ICT). In 2017 the tourism sector contributed around 6.7% of the Gross Domestic Product (about 3,864 million dollars). In addition to this, it contributed 140 thousand jobs around the country, including the coastal areas.

Visitation of tourists within the last years has been increasing, going from 2,192,059 in 2011 to 2,660,257 in 2015; by 2019 it is expected to have a visitation of 3 million tourists. It is within this context where the sport and charter fishing activity is framed.

Specifically, for sport and charter fishing, during 2015, 151,000 fishermen visited the country, equivalent to 5.7% of all visitors. It is clear that the activity represents an important percentage within the national tourism and the economy of the country. According to a research conducted by FECOP (2015), about 1.16% of the GDP is generated from this activity and gives support to different communities engaged in it. The existing social linkage in the coasts of Costa Rica sets the basis for this activity to happen on daily basis and generates, in turn, the dynamics presented above.

Knowing the different characteristics (economic, social, cultural, environmental, political, among others) of the people, households, and communities that work directly in the sport and charter fishing sector, becomes therefore, a core issue of this document. There is an interest in explaining the conditions of people who are related to the activity, as well as determining the importance of the activity for the households and communities engaged in it.

There are geographical points where the activity occurs with greater intensity and therefore were considered as starting points for the collection of information. In addition, the collaboration with leaders, organizations and local companies was essential for the

collection of the data analyzed and presented in this study. These communities, their dynamics and their people are the prominent players of the study.

Within this framework of tourism, tourism and sports fishing, communities, households, people and the interaction among themselves, there were several questions that guided the process:

What are the factors that have implications in these people´s way of living? Could it be that sport and charter fishing has an impact on the life of these coastal populations? And, what are these possible relationships?

## OBJECTIVE

Analyze the quality of life within the framework of the different capitals of the active labor population directly related to tourism and sports fishing, in seven communities of the Costa Rican Pacific.

- Describe the general characteristics of the population studied according to the various capitals
- Determine the factors related to the sport and charter fishing activity that influence the quality of life of the study population

## SCOPE OF THE STUDY

The determined study population consists of people directly related to the charter and sport fishing activity, specifically captains, first mates and boat owners.

In addition, seven distinct communities from the Costa Rican Pacific with a strong presence in the activity and public recognition were defined. These communities were: Playas del Coco-Papagayo, Flamingo-Potrero, Tamarindo, Herradura, Quepos, Puerto Jiménez and Golfito.

Due to the absence of studies on the determined population, there is a descriptive component that characterizes respondents and their families. This information is provided by capital, but also by an explanatory component where causal relationships will be determined; This analysis was carried out through the construction of a quality of life model using secondary and primary data (survey).

The methodology and the interview instrument were designed based on the livelihood approach and the quality of life methodology with the purpose of assessing the impact of sport fishing in the selected communities. Once data were collected and typed, they were analyzed using the Stata V.12 program, in addition to the OrdinalLogit model.

## **METHODOLOGICAL APPROACH:** LIVELIHOODS AND COMMUNITY CAPITALS

All of the activities, possibilities, resources and strategies used to satisfy our needs as human beings are included in the livelihoods. This approach allows for a more comprehensive analysis of the activity (Charter and sports fishing) as it does not focus only on variables of a financial nature, but also includes other important dimensions that influence the subjective satisfaction reported by people.

The resources available to communities and individuals can be classified into two categories: material and human. The human

category includes cultural and social capital, political capital, human capital and cultural capital. Material capitals are the natural capital, financial capital and built capital. Specifically, for the analysis of this activity, the following variables were included in each capital category:

### Natural Capital (NC)

This capital includes, mainly, the assessment of the quality of fisheries (species of interest for sport fishing), climate changes, practices that have impacts on ecosystems.

### Cultural Capital (CC)

It refers to how we see the world (e.g., it explains the special ways of seeing the world) and defines which things are valuable, what we take for granted and what things may be changed (that is, it defines how we act). It is a human construction in response to the NC. Variables that allow defining the aspects of more relative importance in the quality of life of the people of the communities where sport fishing is relevant were included.

### Human Capital (HC)

Characteristics and potentials of each individual that are determined by the interactions between the biological (genetic) and the social factors. HC refers to the abilities, skills, knowledge, education and health of individuals within a community.

### Social Capital (SC)

It refers to the interactions, connections / links and relationships that hold the staff together. From the economic perspective, it is reduced to transaction costs and, from the political perspective, it

promotes the necessary associations to maintain governance and modern democracies. It was decided to analyze the characteristics in the community that allow evaluating mutual trust, groups, collective identity, a sense of a shared future, and team work.

### Political Capital (PC)

It analyzes the ability of a group to influence the distribution of resources, including helping to set agendas for the use of available resources. It manifests itself when there is presence of communities in resource management organizations. The following was analyzed:

- Participation in organizations
- Contribution of women to PC
- Youth contribution to PC

### Financial Capital (FC)

It considers the sum of the resources available to the community (internal and external). In general terms, there is a consensus that FC is more than just cash. The variables that were included are as follows:

- Productive activities: what is produced and what is collected
- (Consumes / sells)
- Savings
- Loans and credits
- Investments
- Donations

## Built Capital (BC)

It is defined as the infrastructure that supports all social and productive activities within a community. The physical infrastructure that increases the value of other capitals or that is used as a means of producing other capitals. The variables included are:

- Home
- Roads
- Health centers
- Electronic communications
- Sport fishing infrastructure

The quality of life methodology consists of asking people to indicate (reveal) their level of subjective satisfaction with their general living conditions. It is a way to establish a baseline of wellbeing that will subsequently be analyzed based on the living conditions of respondents. For this, a numerical scale to be defined by the researcher is used, which varies within a determined range.

In the specific case of this study, a scale ranging from 0 to 4 was used, where 0 indicates the lowest level of satisfaction and 4 the highest possible value. The selection of these values arises from the results obtained in field tests carried out to validate the survey instrument. Initially a scale of 1 to 10 was used, but it was observed that the answers tended to be located in the mean value of the scale. This result is consistent with the empirical evidence.

The psychological and economic theory indicates that the wellbeing of people is directly correlated with the following dimensions (common to all populations):

- Health
- Employment (including the unemployment rate in the community)
- Productive activity (work)
- Income and consumption level
- Environment
- Education
- Security
- Corruption

- Culture, spirituality
- Moral
- Equity and equality

It may be observed that these variables can be classified among the different categories of community capitals described, which facilitates the combination of both methodological approaches.

The quality of life model is analyzed quantitatively, according to the formula below:

$$I = \sum_{i=1}^{n} a_i b_i$$

Where:

I = subjective index of quality of life indicated by each participant

i = each of the dimensions that affect the quality of life

ai = weight of each of the dimensions (i) in the quality of life

bi = value of each of the dimensions that determine the quality of life

The weights of the dimensions included in the analysis are the measure of the impact that each of the variables has on the level of wellbeing indicated by respondents. The estimate of the model will allow to identify the impact that the variables related to sport fishing have on the quality of life.

Most of the information needed to describe the model variables will be collected through the designed survey instrument. In addition, official statistical data on some macroeconomic variables such as transport infrastructure, health and education; unemployment and security in the respective communities, will be sought. The level of detail of the data collected will determine to a great degree the amount and type of information that may be included in the model to explain the level of quality of life of respondents.

The main source of secondary information will be the census and household surveys of the National Institute of Statistics and Census (INEC). One of the limitations that can be found is that the level of disaggregation of the data does not have enough variability to be analyzed statistically.

## SAMPLE

Initially, it was proposed to select a population sample to guarantee the representativeness of the target population. This is made up of the communities of the country where the quality of life of its inhabitants is influenced by sport fishing. Due to the scarce, if not inexistent, information available to characterize these communities, sufficient quantitative data are not available to calculate the ideal sample size or the stratification by community.

Based on the empirical knowledge of FECOP staff, it was estimated that the total population of people engaged in sport and charter fishing (working directly on boats) reaches 1,500 individuals (from personal communication with Incopesca directors in different areas of the country). A total of 304 individuals were interviewed, who

represent 20% of said population. This represented an error of around 5.5%; with a confidence level of 95%.

## INFORMATION RECOLLECTION PROCESS

The fieldwork began on May 9, 2018 and ended on July 27, 2018.

The 304 surveys were conducted thanks to the collaboration of two interviewers and a field coordinator. During the fieldwork, several organizations from the sector participated, namely:

1. Marina Los Sueños.
2. Marina Pez Vela.
3. Marina Papagayo.
4. Sport and charter fishing Associations of Tamarindo, Flamingo, Quepos, Puerto Jiménez and Golfito.
5. Chamber of Fishermen of Guanacaste.
6. CRPrimo store of supplies for sport fishing.
7. Crocodile Bay Resort

These companies and organizations contributed with meeting spaces, logistics and assistance in convening the surveyed population.

The fieldwork begins with eight tests of the instrument, four in the community of Puerto Jimenez, where it is determined to change the scales from 1 to 10 by 0 to 4, due to the low variability of responses. Subsequently, four more tests are carried out in the Quepos area and the scales work better in these tests. Adjustments are made to the instrument and data collection is formally initiated.

The field work began in Quepos with a meeting of captains and first mates in the Marina Pez Vela. Interviews are conducted in groups, the FECOP work team distributes the tasks, one person is responsible for reading and guiding the interview while two team members served two groups.

These two people supervised that the questions in the instrument are filled and understood effectively. This mechanism was repeated in the other meetings and care was taken to direct both the group and each of the persons surveyed.

These meetings lasted approximately 90 minutes, since the objective was explained in detail and the instrument was followed question by question. The fieldwork is completed with the last meeting in Guanacaste, in the Tamarindo area.

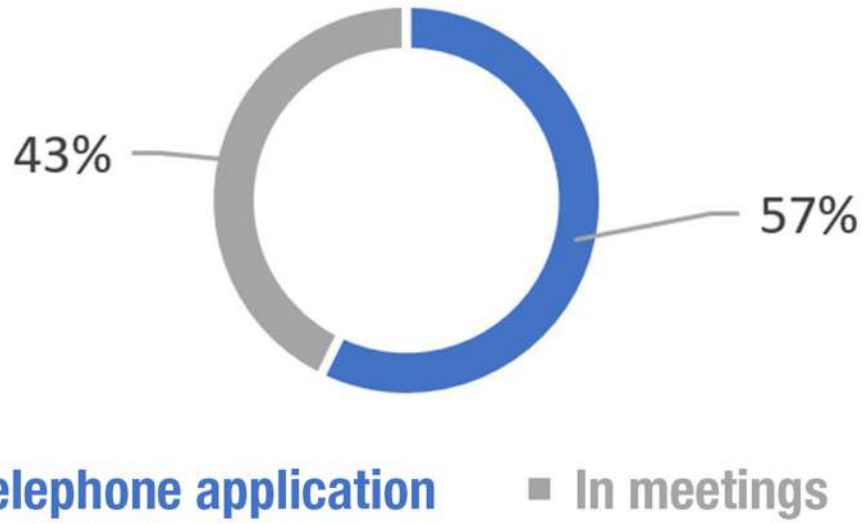



Figure 3. Percentage of application according to the survey form
Source: Own elaboration from information collected, 2018.

Parallel to the meetings are telephone interviews (174 surveys in total or 57%) after making the tours to the different locations, to the numbers referred by respondents; These surveys took about 30 to 40 minutes. Prior to the calls, it was coordinated with a leader in the area to announce that calls would be made, which facilitated conversations with different people in each place.

In general, each meeting was attended by 15 to 25 people (130 surveys or 43%), convened by the leaders who were previously contacted. Even so, telephone surveys helped complete the defined quota. Chart 1 explains the number of people by community, as well as the place where the meeting took place.

**Chart 1**
Place and number of participants per meeting

| COMMUNITY | # of participants | Place |
|---|---|---|
| Quepos | 26 | Marina Pez Vela |
| Puerto Jiménez | 16 | Cocodrilo Bahía Resort |
| Golfito | 18 | Mar y Luna Hotel |
| Tamarindo | 21 | Restaurant close to the beach |
| Flamingo-Potrero | 12 | Basilito´s former school |
| Playas del Coco-Papagayo | 12 | Marina Papagayo and the Chamber of Fishermen of Guanacaste |
| Herradura | 25 | Marina Los Sueños |

**Source:** Own elaboration from information collected, 2018.

# RESULTS

Respondents perform various activities within the sport and charter fishing field. In general, captains, first mates and vessel owners were surveyed, but mostly captains and first mates.

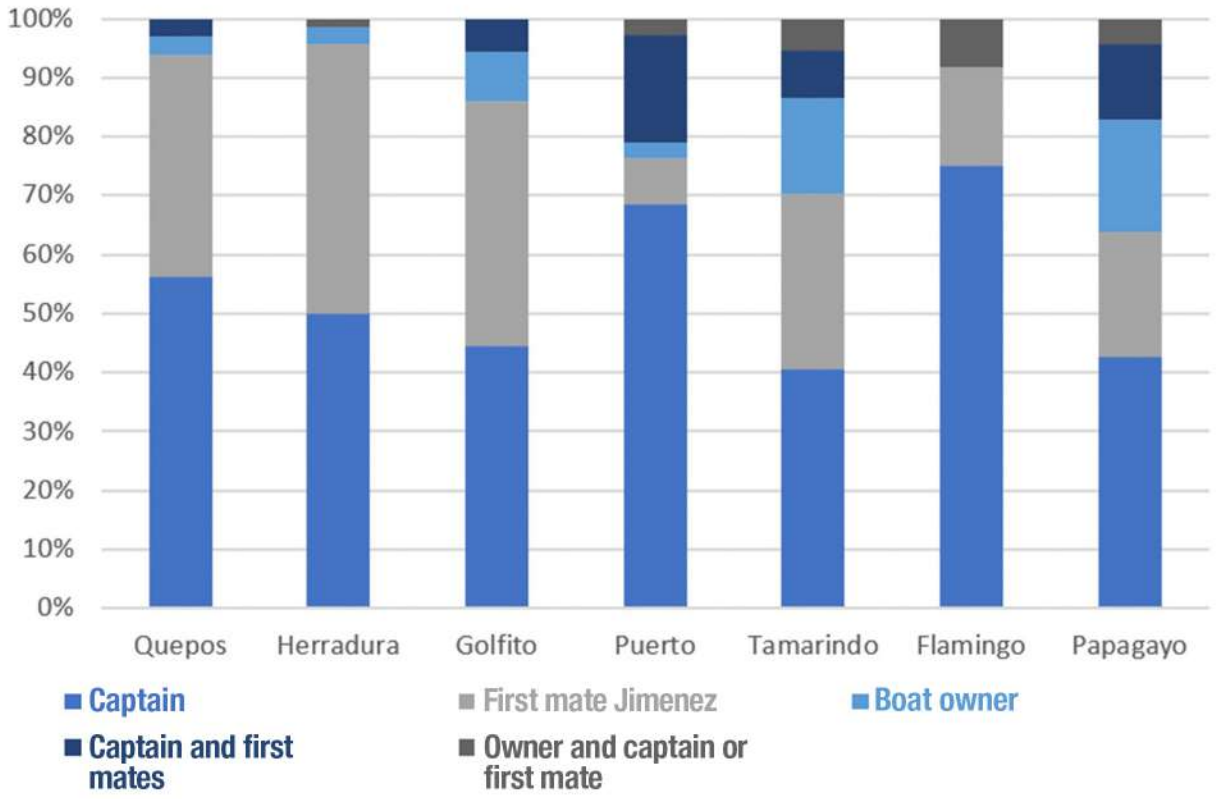



Figure 4. Occupation of respondents according to their place of residence
Source: Own elaboration from information collected, 2018.

In the communities of Flamingo and Puerto Jiménez, more than 70% of respondents were captains, while in Tamarindo and El Coco,

the percentage of employed captains was lower, reaching no more than 42% in each place, but these were the places where more vessel owners attended, compared to the others. The places where there was more participation of first mates were the communities of Herradura and Golfito, with almost 45% in both cases.

The average age of respondents is 40 years, with a distribution concentrated in the ranges of young age (40% are between 18 and 35 years old) and middle (43% are between 36 and 50 years old); 14% are over 50 and under 65, while 3% are over 65.

**Chart 2**
Age of respondents

| Age | Observations | Percentage |
|---|---|---|
| 18 to 35 years | 116 | 38.16 % |
| 36 to 50 years | 137 | 45.07 % |
| 51 to 65 years | 43 | 14.14 % |
| 65 and older | 8 | 2.63 % |
| Total | 304 | |

**Source:** Own elaboration from information collected, 2018.

The largest age group among respondents corresponds to people from 36 to 50 years old, with 45%, followed by the group of people from 18 years to 35 years old, with 38%. These young adults are the majority of the surveyed population.

The educational level per area keeps the general average tendency, where high school is the most common educational level in each of the seven sites, followed by primary education. People surveyed with technical education are found only in two communities (Quepos and Herradura), while people with no educational level are found in three communities (Golfito, Jiménez and Papagayo).

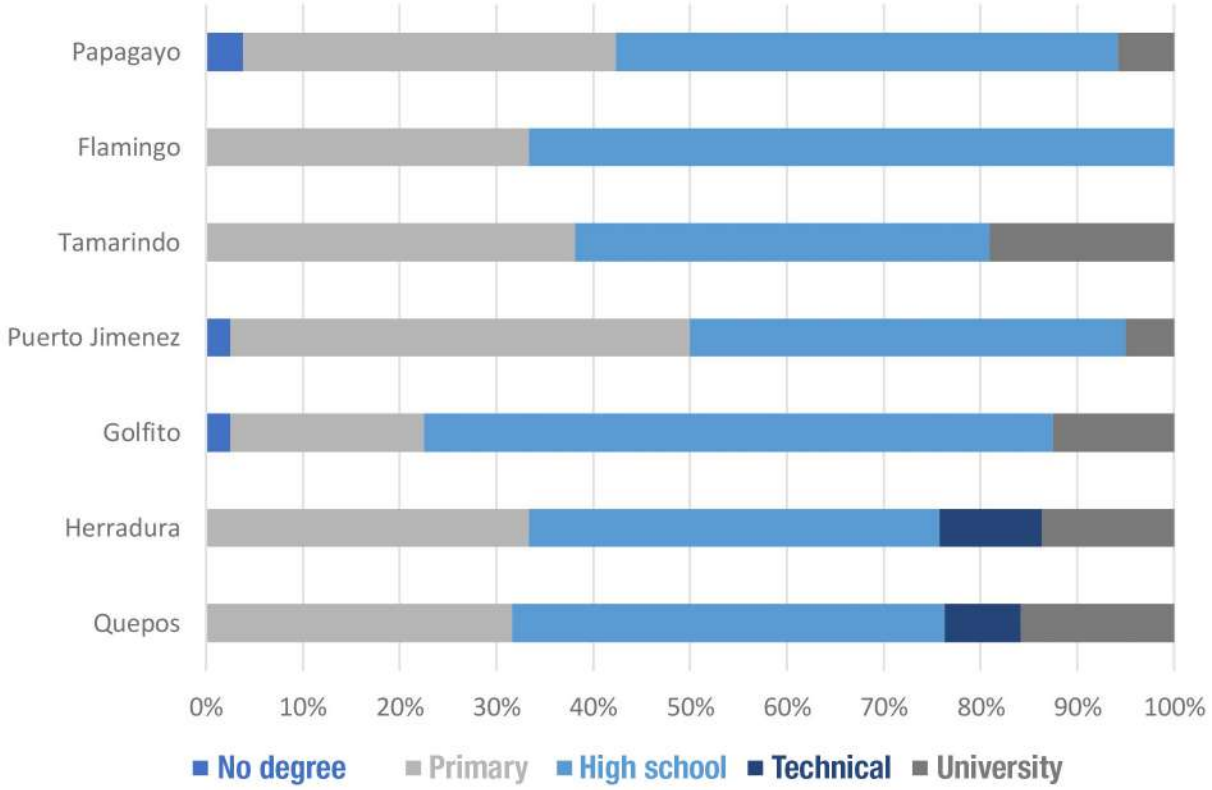



Figure 5. Educational level of respondents according to their place of residence
Source: Own elaboration from information collected, 2018

The majority (49%) have studies at high school level (both complete and incomplete); the second group in importance is the one that had primary school studies (35%); followed by individuals with university studies (11%) and technicians (3%).

In relation to the respondents´ families, they have an average of 3.15 members. The number of members per household is between 2 and 4 people. Families with more than 4 members are few, around 8.2%, the same as people who live alone, representing 13.5% of the total.

**Chart 3**
Number of people in the respondents´ families

| Family members | Percentage |
|---|---|
| 1 | 13.5 |
| 2 | 24.7 |
| 3 | 27.6 |
| 4 | 25.0 |
| 5 | 6.6 |
| 6 | 1.6 |
| 7 | 1.0 |
| Total | 100.0 |

Source: Own elaboration from information collected, 2018.

The members of the respondents´ families are mainly students (children) 41%, followed by housewives (spouses) 27%, other informal activities 9%, and another group that carries out activities related to sport and charter fishing 7% (cleaning of boats, engine mechanics, repair of air conditioning, among others).

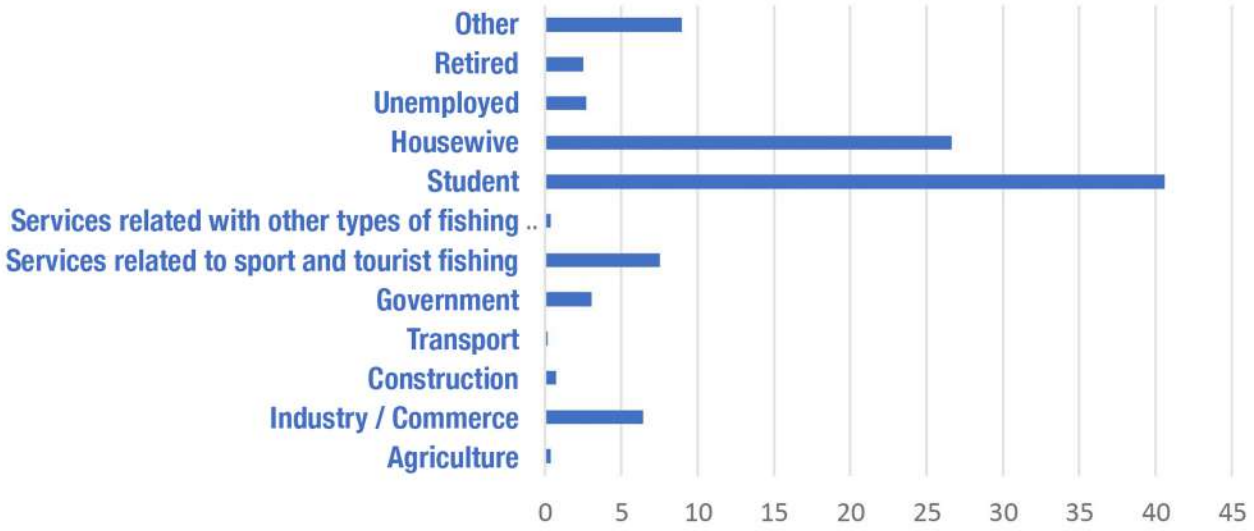



Figure 6. Main occupation of respondents´ household members
Source: Own elaboration from information collected, 2018.

Migration between localities, or outside the country, is not very high. 24% of respondents say they have migrated due to labor issues.

**Chart 4**
People surveyed who affirm having migrated due to labor issues in the last 3 years

| Answer | Percentage |
|---|---|
| Yes | 24.3 |
| No | 75.0 |
| Does not respond | .7 |
| Total | 100.0 |

**Source:** Own elaboration from information collected, 2018.

That 24% who affirm having migrated went mostly to places within the country. Herradura is one of the communities with the highest percentage of reception of people who moved with 37%, followed by other countries with 19% and Quepos with 18%. Communities such as Golfito, Puerto Jiménez, Tamarindo and Playas del Coco are the ones that received the least number of people who migrated due to employment circumstances.

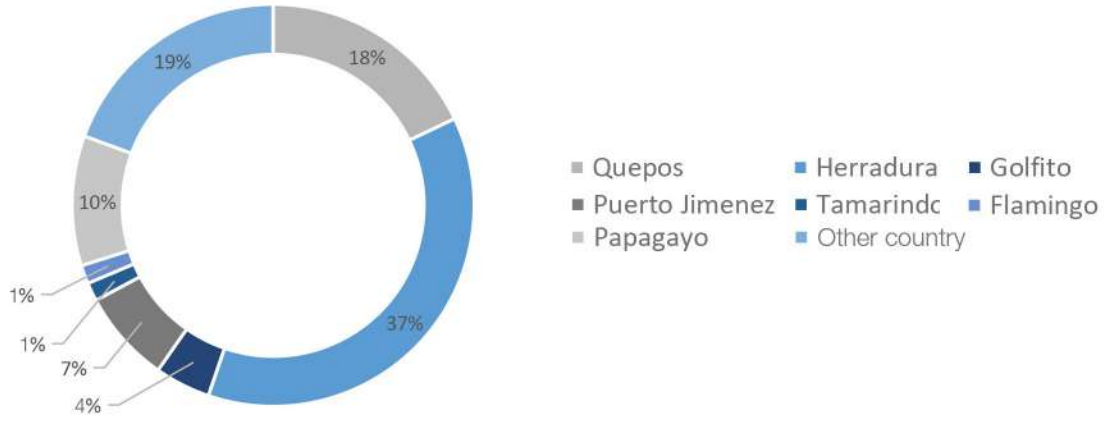



Figure 7. Place where respondents migrated within the last 3 years
Source: Own elaboration from information collected, 2018.

Regarding the role of young people and women in the activity, people surveyed reported having noticed changes mainly in young people; 58% affirm that young people have had changes, among which the most important ones are:

- Greater participation in the sport and charter fishing activity
- Willingness to learn and be trained in the activity (they have specialized in the trade)
- Better willingness to take care of natural resources. More awareness with the care of the different species of importance for the sector

**Chart 5**
Perception of respondents in relation to changes in the role of young people and women in the activity

| | Youngsters | Women |
|---|---|---|
| Yes | 58.6 | 28.6 |
| No | 39.6 | 68.4 |
| NK NR | 1.6 | 3.0 |
| Total | 100.0 | 100.0 |

**Source:** Own elaboration from information collected, 2018.

In relation to women, respondents affirm that the role has not changed much; 68% affirm that there are no changes. Between the grouped answers, the following points can be defined:

- There is very little participation of women in the activity, as captain or first mate
- They have assumed roles in marketing and administration

Finally, in the subject of training and education in specific topics of sport and charter fishing (basic sailing, first aid, emergency situations, and boat captain), 53% of respondents and their families have been trained by an institutional program of INA, 47%; Incopesca 2.3% and ICT 2.6%.

**Chart 6**
Members of the respondents´ families who have received training from an Institution

| Training programs | Percentage |
|---|---|
| INA | 46.7 |
| Incopesca | 2.3 |
| ICT | 2.6 |
| Has not received any | 47.7 |
| NK NR | 0.7 |
| Total | 100.0 |

**Source:** Own elaboration from information collected, 2018.

In the survey, participants were consulted on three aspects related to the physical capital built; In the first place, they were consulted about the tenancy of the house where they live with their family nucleus; Then, they were asked about the level of satisfaction with the support infrastructure for sport fishing activities in their community: shipyards, docks, marinas and other; Finally, they were asked about the relevance of the selected elements that support the sport and charter fishing activity.

The majority of households live in their own homes: 62% of the total sample with variations among communities, with Puerto Jiménez and Flamingo reporting the lowest percentage of own housing (approximately 54%); while El Coco reports 74%.


Figure 8. House tenancy of the family nucleus
Note. Values denote a percentage (5)
Source: Own elaboration from information collected, 2018.

The answers were validated with the knowledge of experts in the area in the sense that qualifications (satisfaction) were not considered in the communities where there is no qualified infrastructure. For example, if any of the persons rated their satisfaction with the marina located in Puerto Jiménez, that response was not considered in the analysis because the community has a pier, not a marina.

It should be considered that the Papagayo marina was grouped in the Coco zone, reason why it was considered as one of the communities with a marina. In addition to this, most of respondents, in said site, claimed to be residents of Playas del Coco or its surroundings.

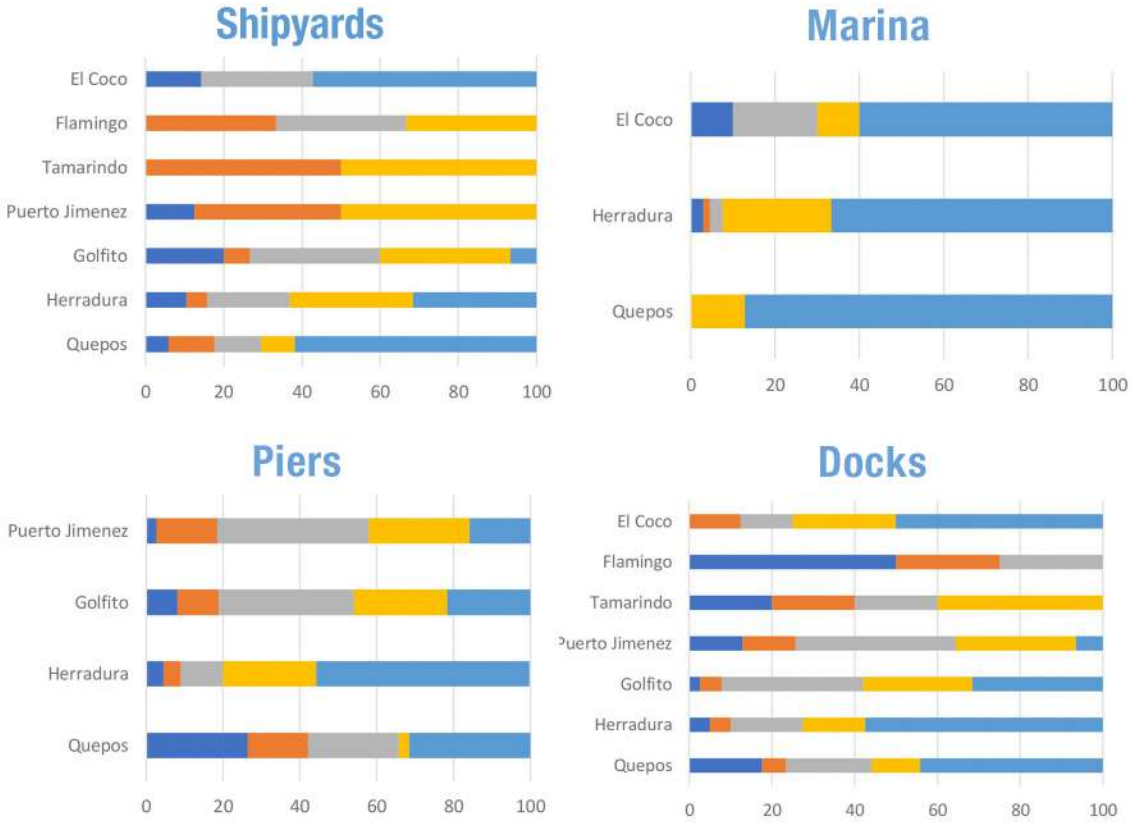



Figure 9. Level of satisfaction (from 0 to 4) with sport fishing infrastructure by community
Source: Own elaboration from information collected, 2018.

The sport and charter fishing sector distributed on the Pacific coast of Costa Rica is dispersed in organizational terms. 16% of respondents affirm that they are active members of a community or local organization. These organizations range from associations related to tourism and sports fishing, to local development associations, and water associations, among others.

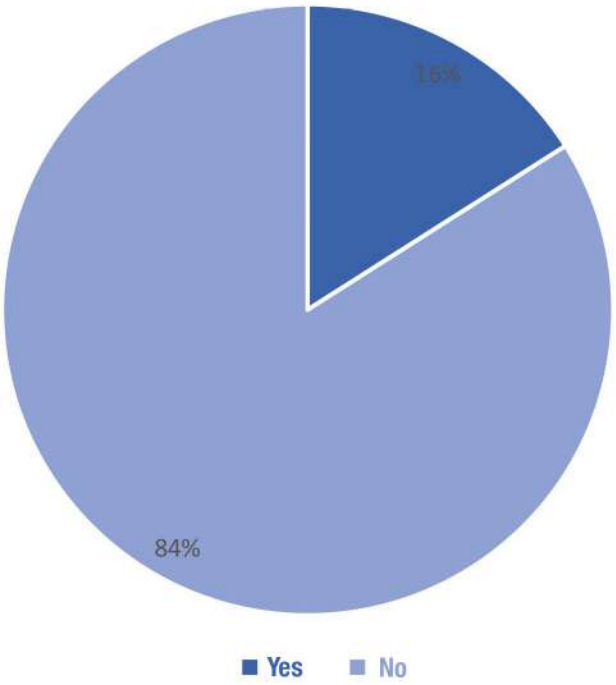



Figure 10. Participation of respondents in local organized groups
Source: Own elaboration from information collected, 2018

10% of all family members also belong to some sort of community organization. The most common ones are development associations and associations related to tourism and sports fishing. The family members who usually participate in these organizations are the respondents´ spouses.

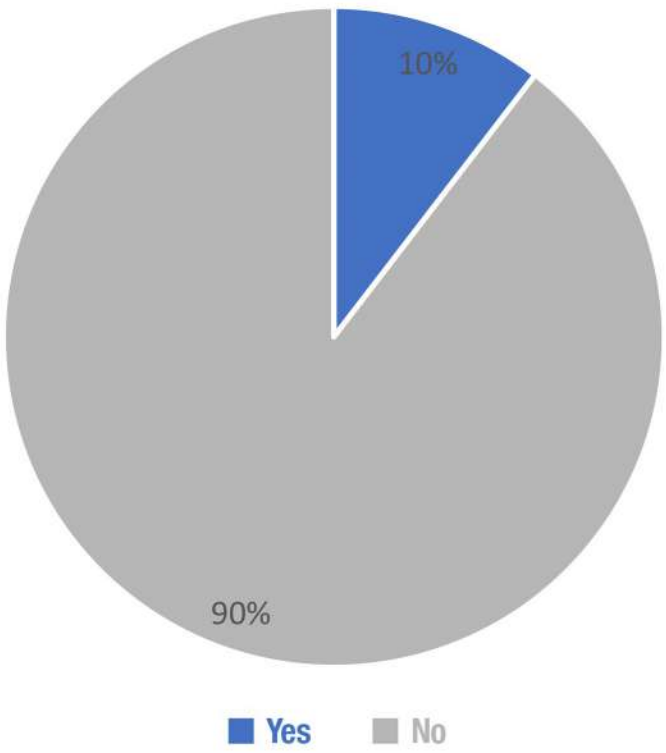



Figure 11. Participation of different household members in local organized groups
Source: Own elaboration from information collected, 2018.

Regarding the knowledge of laws that affect or favor the activity, 61% of respondents are unaware of laws related to the sport and charter fishing activity and 38% claim to know laws that regulate the same. The laws that are known by the surveyed population are framed within the naval, fishing and environmental areas.

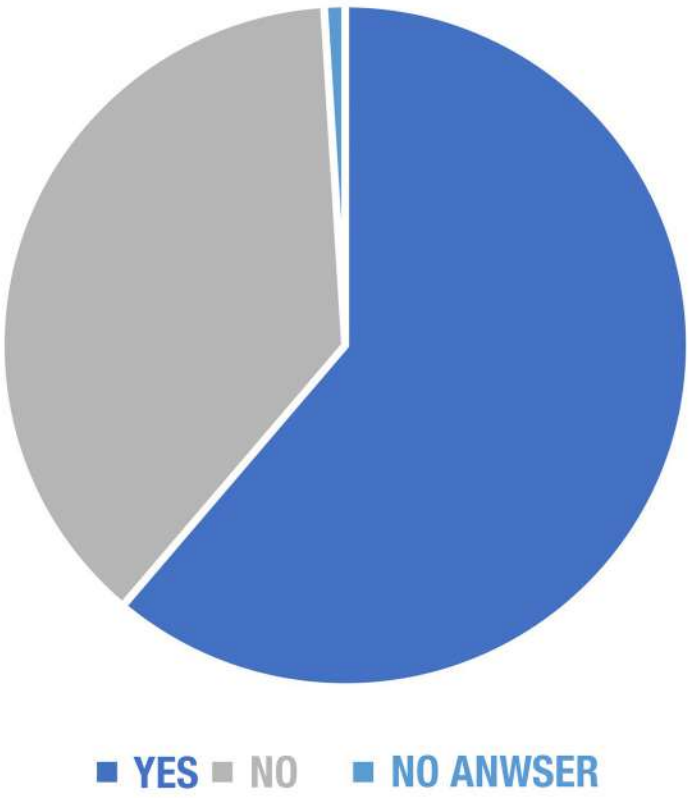



Figure 12. Knowledge of laws related to fishing, environment and navigability by respondents
Source: Own elaboration from information collected, 2018.

There is knowledge on the regulations that frame tourism and sports fishing, as well as restricted fishing areas (national parks, reserves, etc.), regulations referring to the autonomy of vessels and licenses to carry out the activity.

Within the natural capital, certain variables were considered within the survey, such as:

1. Positive and negative practices for the fishing resource
2. Availability of the fishing resource
3. Changes in climatic factors

The sport and charter fishing sector uses diverse fishing resources in its daily operations. There are some practices that are considered negative for said resources.

**Chart 7**
Practices that people surveyed mention to follow or stopped doing within their daily operations

| | Bring the sailfish aboard | Keep more than 5 pieces per trip | Use a J-hook with live bait |
|---|---|---|---|
| Yes | 10.9 | 27.6 | 8.2 |
| No | 85.9 | 67.4 | 86.8 |
| Does not respond | 3.3 | 4.9 | 4.9 |
| Total | 100.0 | 100.0 | 100.0 |

**Source:** Own elaboration from information collected, 2018.

The majority of respondents affirm not having these practices anymore: "bring the sailfish aboard", 85%; "keep more than 5 pieces per trip" 67% and, finally, "use J-hooks with live bait "87%. On the other hand, 27% of people affirm to keep more than 5 pieces per trip, which is the highest percentage of answers related to negative practices.

In relation to positive practices for the fishing resource, most people surveyed perform these practices: "catch and release", 95%; "use circle hooks", 92%; and “help fish to recover in the water after catch and release”, 95%.

**Chart 8**
Practices that people surveyed mention to do or not within their daily operations

| | Catch and release of species of interest | Use circle hooks | Help the fish to recover in the water |
|---|---|---|---|
| Yes | 95.4 | 92.4 | 95.4 |
| No | 1.6 | 3.3 | 0.7 |
| Does not respond | 3.0 | 4.3 | 3.9 |
| Total | 100.0 | 100.0 | 100.0 |

**Source:** Own elaboration from information collected, 2018.

There are several important species for tourism and sports fishing, respondents valued the availability of these species for their activity.

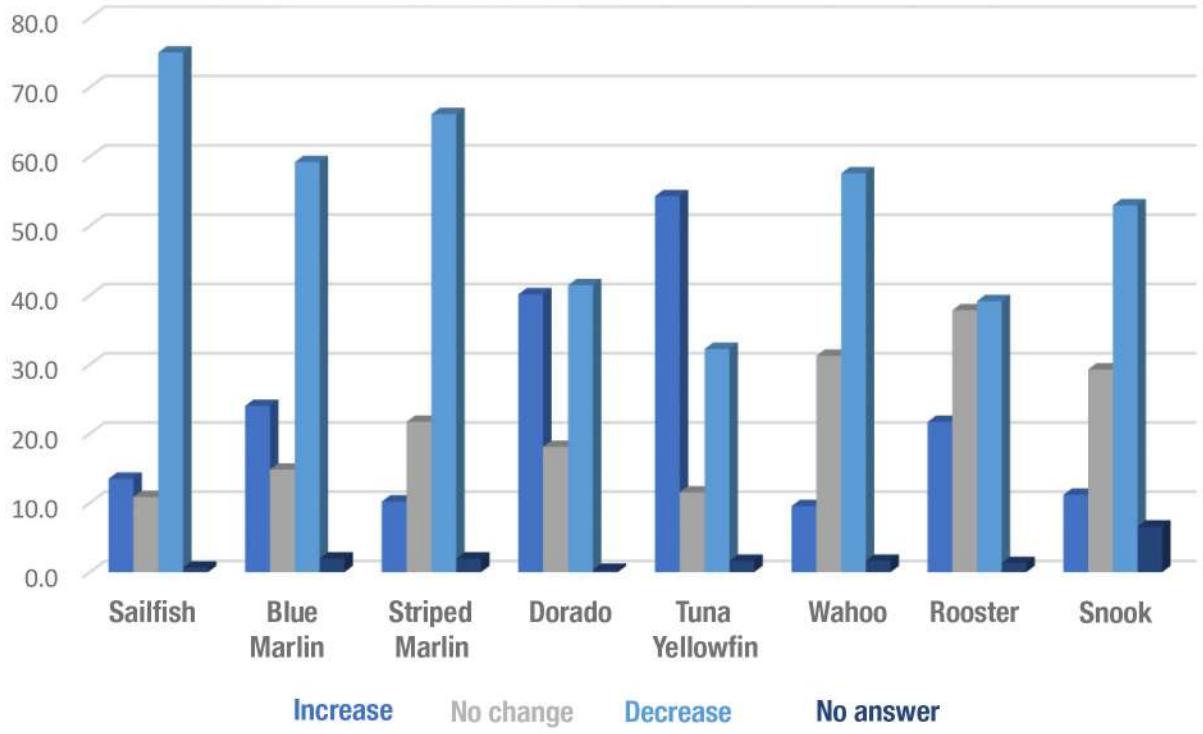



Figure 13. Assessment of the availability of species of interest for sport fishing by respondents
Source: Own elaboration from information collected, 2018.

54% of respondents affirm having perceived an increase in the yellowfin tuna, which is the species that reports the highest percentage of increase, while for the sailfish, 75% say there has been a decrease, which is the species with the highest decrease reported. On the other hand, the rooster fish has the highest percentage of response as having remained unchanged, with 37.5%.

Other important species for the activity, such as marlins, are reported as decreasing, 59% for blue marlin and 66.1% for striped marlin.

In general, pelagic species (billfish, dorado and tuna) with the exception of yellow fin tuna, seem to decrease according to the perception of the surveyed population. Likewise, coastal species

(Rooster, Robalo and Wahoo) tend to decrease, but in relation to the first group with less percentage in their response.

**Chart 9**
Assessment of the availability of species of interest for sport fishing by respondents

| Asessment | Sailfish | Blue Marlin | Striped Marlin | Dorado | Yellow Fin Tuna | Wahoo | Rooster | Snook |
|---|---|---|---|---|---|---|---|---|
| Increase | 13.5 | 24.0 | 10.2 | 40.1 | 54.3 | 9.5 | 21.7 | 11.2 |
| No change | 10.9 | 14.8 | 21.7 | 18.1 | 11.5 | 31.3 | 37.8 | 29.3 |
| Decrease | 75.0 | 59.2 | 66.1 | 41.4 | 32.2 | 57.6 | 39.1 | 53.0 |
| Does not respond | 0.7 | 2.0 | 2.0 | 0.3 | 1.6 | 1.6 | 1.3 | 6.6 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Source:** Own elaboration from information collected, 2018.

The change of the different climate factors was a consideration within the instrument. For the most part, respondents affirm that there is a change in factors related to temperature and precipitation, among others.

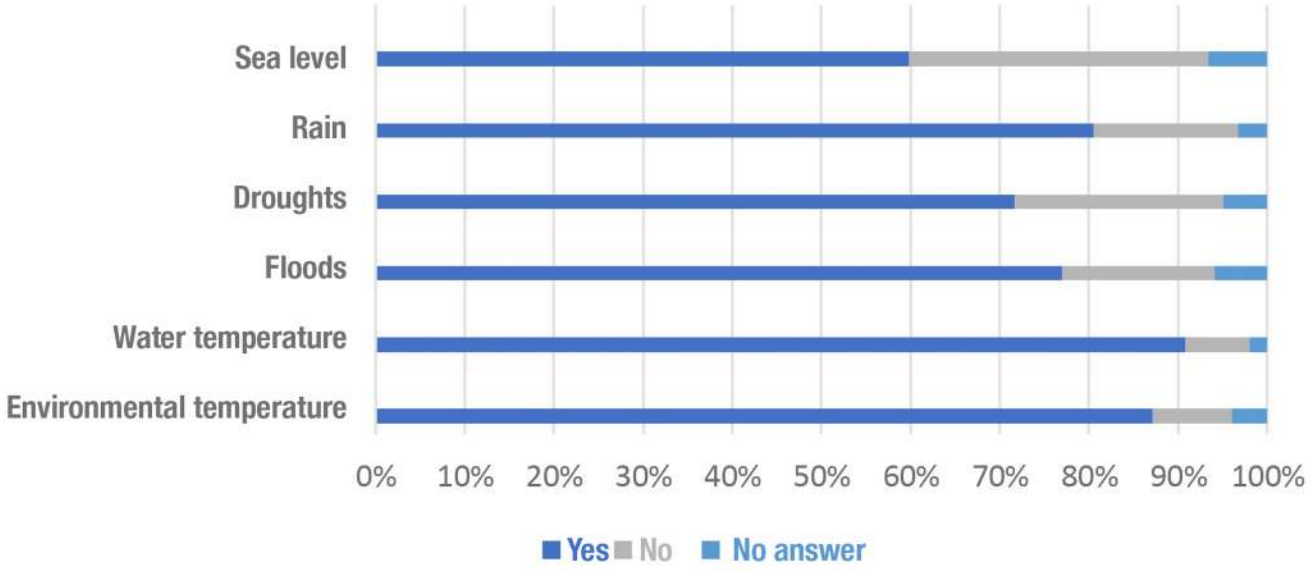



Figure 14. Perception of people surveyed in relation to changes in different climatic factors
Source: Own elaboration from information collected, 2018.

The water temperature was the factor that people surveyed claim as having changed the most, with 90% of the total, followed by the environmental temperature with 85%, rainfall with 80%, flooding

with 77%, drought with 71% and, finally, the sea level, which is the factor with the lowest affirmative answers, with 60%

They were also consulted whether these changes have had an impact on the sport and charter fishing activities carried out. Responses varied, but it was concentrated between the categories of “2” and “4”, which represent “somehow” and "too much", respectively. The assessment “2” received 25% of responses, the assessment “3”, 40.5% and the last one, “4”, 24.3%.

**Chart 10**
Perception of how much the economic activity has been negatively affected as a result of changes in climate within the last 5 years

| Assessment | Percentage |
|---|---|
| 0 | 5.6 |
| 1 | 2.3 |
| 2 | 24.7 |
| 3 | 40.5 |
| 4 | 24.3 |
| Does not respond | 2.6 |
| Total | 100.0 |

**Source:** Own elaboration from information collected, 2018.

In the survey, four variables related to financial capital were evaluated:

1. Primary source of family income.

2. Sector in which they work when they are not working in sport fishing.

3. Number of months per year they work in sport fishing.

4. Total monthly income and income from tips.

The results show that sport and charter fishing contributes 87% of the income of families engaged in this activity: 82% comes directly from sport fishing and 5% from tourism related to sport fishing. Other activities contribute the remaining 13%.

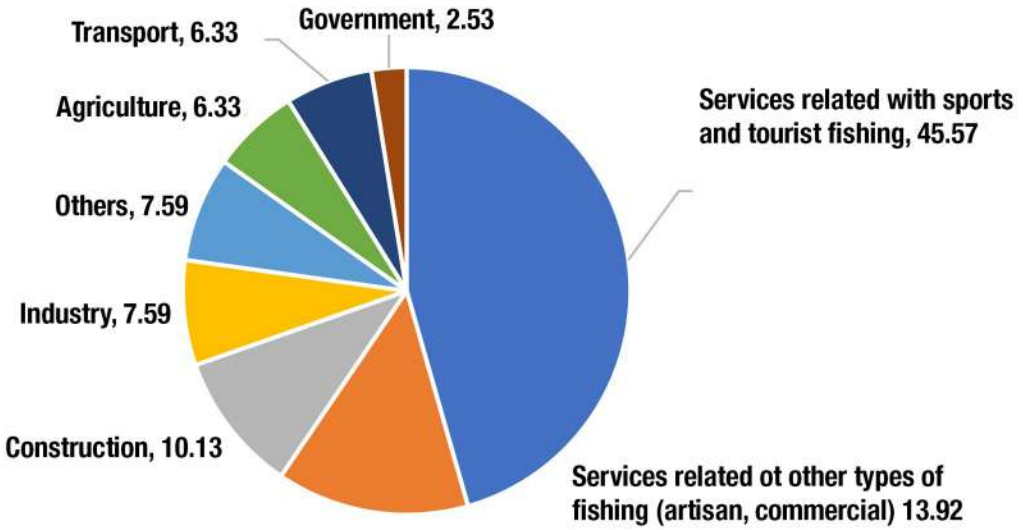



Figure 15. Complementary productive activities respondents are engaged in
Source: Own elaboration from information collected, 2018

27% of all respondents mentioned having a second job. Among the complementary productive activities, the services related to sport fishing stand out, with 46%. These services include repair of vessels, preparation of food for vessels, cleaning hull, basic boat mechanics, accounting and administration of family businesses related to sport fishing, among others. The second complementary activity in importance is the provision of services related to other types of fishing (artisanal and commercial), followed by construction (10%), industry (7%), others (7%), agriculture (6%), transportation (6%) and government (2%) (See Chart 13).

On average, respondents work in the sport fishing activity 10 and a half months a year. The communities of Puerto Jiménez and Golfito are the ones with the lowest number of months dedicated to the activity, with approximately eight months on average, depending on the case.

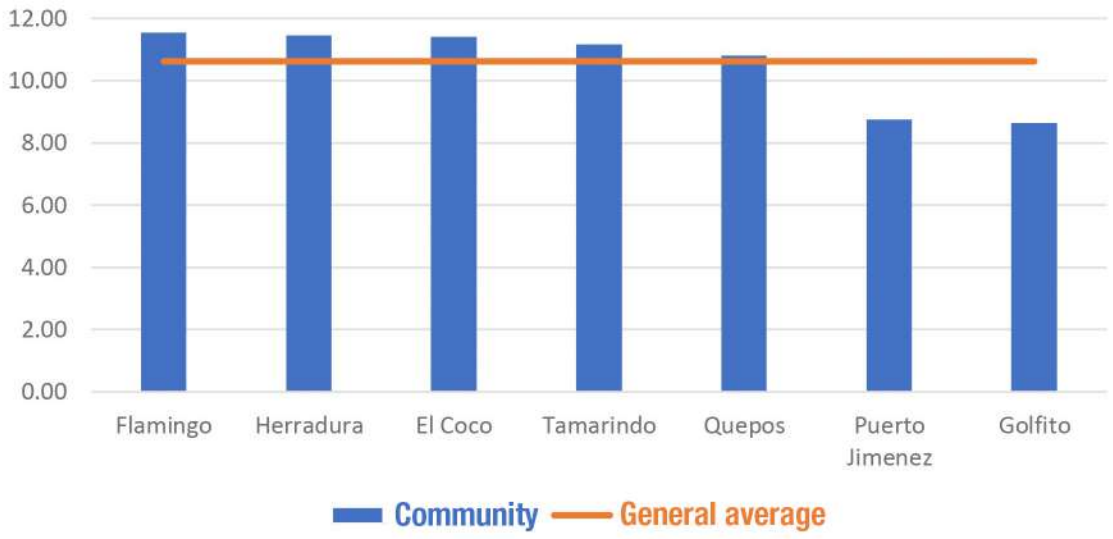



Figure 16. Number of months worked by respondents in the sport and charter fishing activity
Source: Own elaboration from information collected, 2018

Regarding to income, the majority of respondents say that their monthly income ranges between $ 500 and $ 1000 (31%), followed by another large group of people who claim to have a monthly household income of over $ 2000 dollars (26%).

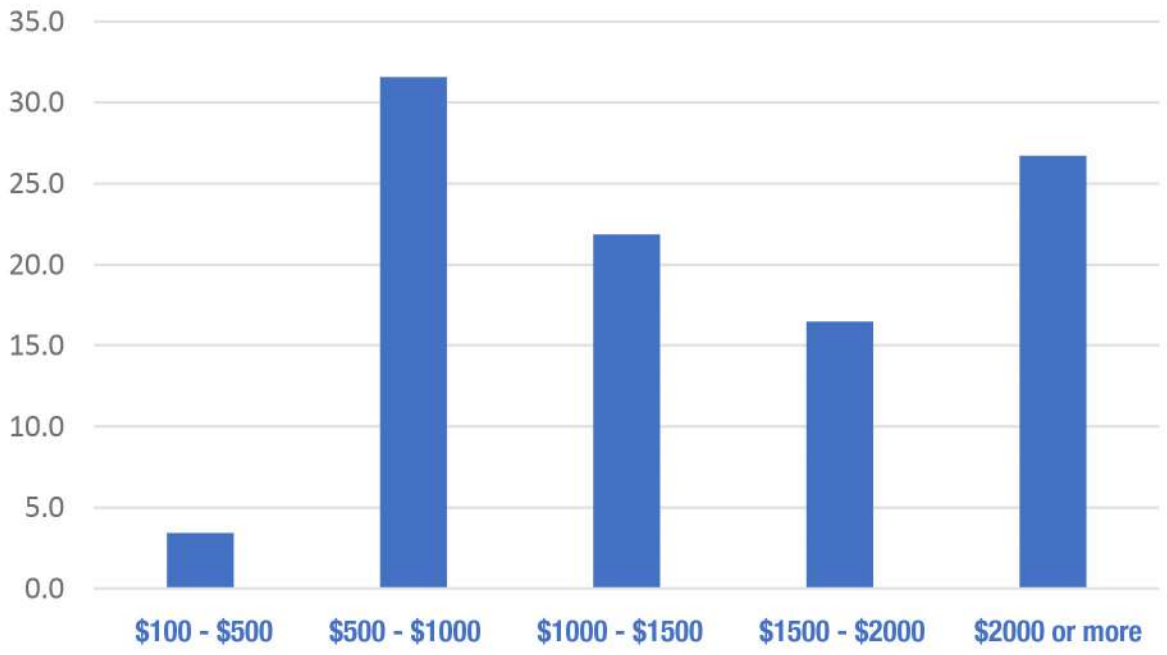



Figure 17. Household income according to respondents
Source: Own elaboration from information collected, 2018

Another group of people states that their families have an income between $ 1000 and $ 1500. A fourth group, about 16%, reports a household income between $ 1500 and $ 2000.

This household income reported varies according to the area or community; Herradura, Quepos and Tamarindo report the largest number of households within the range of $ 2000 or more. El Coco, Tamarindo and Puerto Jiménez report the largest number of households between $ 500 and $ 1000 dollars per month.

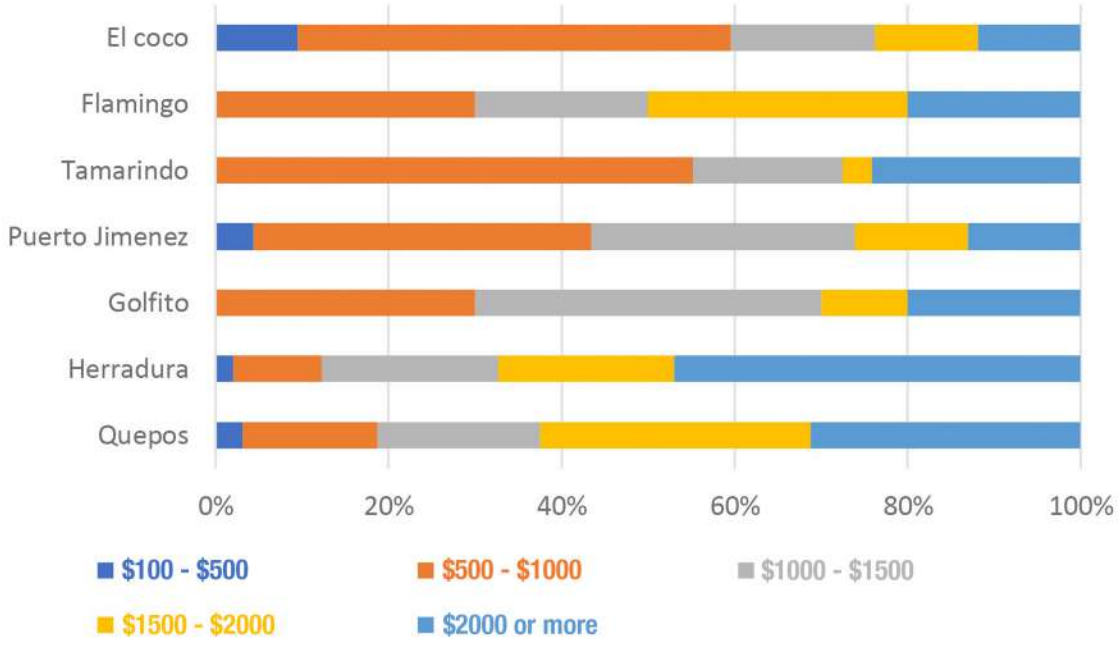
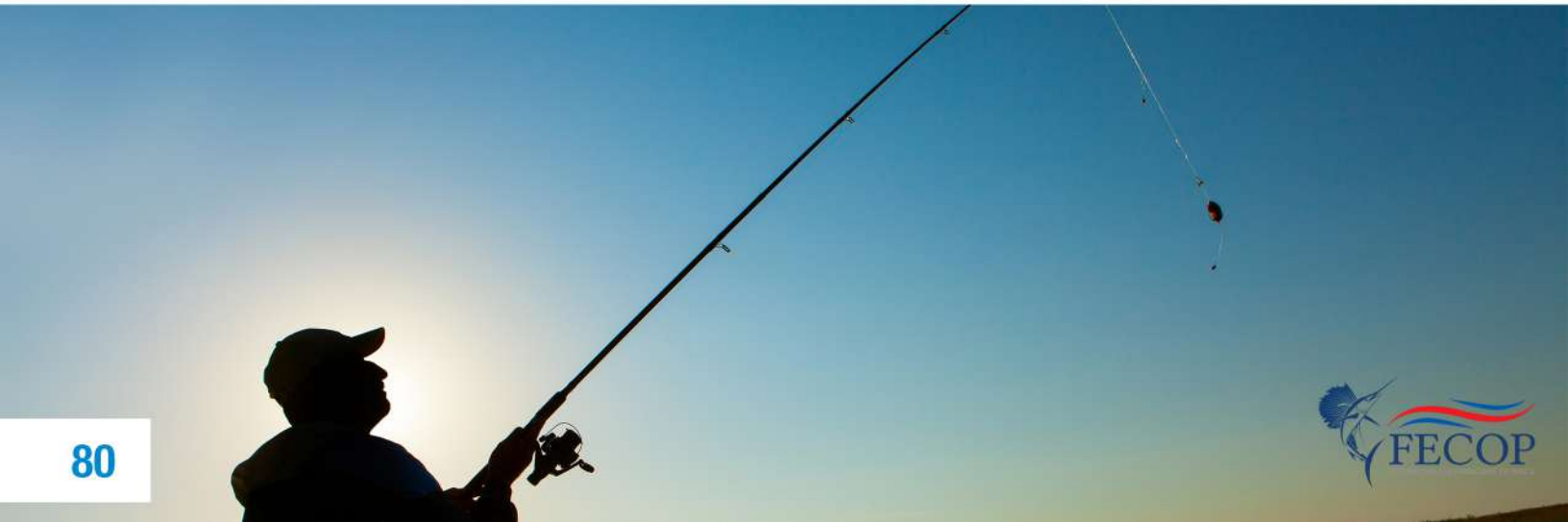



Figure 18. Household income reported according to respondents´ place of residence
Source: Own elaboration from information collected, 2018.



Finally, families that report having an income between $ 100 and $ 500 are a low percentage, mainly El Coco (8%), Puerto Jiménez (4%), Quepos (3%) and Herradura (2%).

## QUALITY OF LIFE

The model used to achieve the relationships was run with 218 observations as a minimum and up to 228 observations as a maximum. The following variables were used:

PHOTOGRAPHY: EDDY BROWN

**Chart 11**
Variables included in the quality of life model used

| | |
|---|---|
| Individual characteristics | Age<br>Migration for employment reasons<br>Member of organizations<br>Educational level<br>Other work reported<br>Training |
| Household characteristics | Household tenancy<br>Household size<br>Total income |
| Perception of the fishery resource | Assessment on availability of Tuna, Sailfish and Marlin<br>Total assessment on the species arranged in the survey |
| Community characteristics | Place of residence<br>Robberies and assaults by county<br>Political participation by county<br>Occupancy rate<br>Lack of health by district |

**Source:** Own elaboration from information collected, 2018.

These variables gave a solid and robust analysis model to find causal relationships between/among them. After running the model, it was determined that there are certain important relationships, since there are factors that directly affect the quality of life of the population studied and others that are not significant in their relationship with this condition.

Once the model was run, results were obtained; The tables that include the non-significant variables for the model are found in the annexes of the document, as well as other complementary tables where the information is available numerically.

**Chart 12**
Direction and significance in the perception of quality of life

| | Fishing increases | Fishing decreases | Tuna increases | Tuna decreases | Sailfish increases | Sailfish decreases | Marlin increases | Marlin decreases |
|---|---|---|---|---|---|---|---|---|
| <u>Personal and household variable</u> | | | | | | | | |
| Income of the family group | + | + | + | + | + | + | + | + |
| | ** | ** | ** | ** | ** | ** | ** | ** |
| Migrates due to employment reasons | - | - | - | - | - | - | - | - |
| | * | * | * | * | * | * | * | * |
| Has received technical assistance (Training) | + | + | + | + | + | + | + | + |
| | ** | ** | ** | ** | ** | ** | ** | ** |
| <u>Perception variables</u> | | | | | | | | |
| Change in fishing | + | 0 | 0 | 0 | 0 | 0 | + | 0 |
| | *** | 0 | 0 | *** | 0 | 0 | * | |
| Satisfaction with the sport fishing infrastructure | + | + | + | + | + | + | + | + |

| Community variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Golfito | - | - | - | - | - | - | - | - |
| | *** | *** | *** | *** | -1.9 | (2.05)* | (1.98)* | -1.82 |
| Puerto Jiménez | - | - | - | - | - | - | - | - |
| | -1.78 | -1.73 | -1.73 | -1.78 | -1.67 | -1.8 | -1.74 | -1.59 |
| Tamarindo | - | - | - | - | - | - | - | - |
| | * | * | * | * | * | * | * | * |
| Flamingo | | | | | | | | |
| Quepos | - | - | - | - | - | - | - | - |
| | * | *** | * | * | *** | *** | * | *** |
| El Coco | - | - | - | - | - | - | - | - |
| | *** | *** | *** | *** | *** | *** | *** | *** |
| Observations (Training) | 228 | 228 | 228 | 228 | 228 | 228 | 228 | 228 |

Absolute value of z statistics in parentheses

Own elaboration from information collected, 2018

There is a significant and direct relationship between quality of life and income. The higher the income, the better quality of life. In relation to migration for employment reasons (inside or outside the country) there is a relationship, the quality of life is affected and it decreases.

Regarding possible relationships with age and quality of life, this was not significant. Therefore, in this population, age is not relevant within the model. Another non-significant variable was how many months the population work in the fishing activity. The gender variable was not included because all respondents were men, except for one.

The level of formal schooling is not significant within the model on the other hand, the training variable (INA, INCOPESCA and ICT) was significant, which highlights an interesting point. The fact of having received training or not, does directly affect the quality of life of the population and their families. It is important to remember that the majority of the population received INA training in topics related to Basic Shipping.

## HOUSEHOLD CHARACTERISTICS

The variables analyzed within this component of the model were generally determined as non-significant. Living in one's own home or not, was not statistically significant for the quality of life, the same as the household size.

## PERCEPTION OF THE FISHING RESOURCES

Within this component of the model, important relationships were determined in how the perception of the resource affects the quality of life of respondents and their families. In general, it was observed that if respondents perceive that total fishing decreases there is no significant impact, but if they perceive that in increases, it is significant for the quality of life and the same increases as well.

**Chart 13**
Impact of the perception of availability of species of interest for sport fishing in the perception of quality of life

| | Increases | Decreases |
|---|---|---|
| All species | 0.567 | -0.529 |
| | (-1.84)*** | -1.28 |
| Tuna | 0.392 | -0.636 |
| | -1.3 | (-1.95)*** |
| Sailfish | 0.38 | -0.659 |
| | -0.86 | (-1.77)*** |
| Marlin | 0.713 | -0.154 |
| | (2.07)* | -0.46 |
| Observations | 228 | 228 |

Absolute value of z statistics in parentheses

Source: Own elaboration from information collected, 2018.

It is determined that the decrease in billfish (blue and striped) is not significant, contrary to its increase; If the respondent´s perception is an increase, their quality of life is proportional to this assessment.

In regards to the perception of an increase or decrease of tuna, it was possible to infer that if tuna is perceived to increase, there is not a significant effect, but if the perception is that the tuna resource decreases, the quality of life is negatively affected.

Finally, a species of great importance for the sector, the sailfish, is analyzed. If respondents perceive that there has been no increase in the species, there is no impact, but if they perceive that the availability of this resource decreases, there is a significant impact on the quality of life and the same decreases.

## CHARACTERISTICS OF THE COMMUNITY

In this section, it was analyzed if the place of residence and the infrastructure conditions have a relationship with the quality of life, and the answer is definitely yes. For instance, the living conditions in Golfito, Tamarindo, Quepos or el Coco are lower than in Herradura.

Very strongly related to this element is the satisfaction with the different types of infrastructure. The satisfaction with the sport and charter fishing infrastructure had an impact on the quality of life. It is significant for all the models created and the one used.

# CONCLUSIONS

In relation to the most general conclusions found in the studied population, we have that:

1. Households: the households of respondents in the sector consist of families smaller than the district average reported, according to the 2011 Census.

2. Income: Total income is high, with an average of $ 1,900 per month. The surveyed population has an income above the minimum wage and the country´s average family income.

3. Participation of women: sport and charter fishing is a masculinized trade, there was only one case of a woman working with vessels.

4. Youth participation: there is not a more prominent age group, the population surveyed is fairly uniform and there are people of all age groups working in the sector.

5. Practices with the natural resource: the sector maintains good practices with the resource, but there is a small population that continues carrying out harmful practices for the different species.

One of the general results before applying the quality of life model is that no one perceives that their quality of life is at the lowest level of the scale used and, only two individuals (one in Tamarindo and another in Golfito) reported the level 1, the second lowest on the list. With this, the perception of their quality of life was concentrated between the values of 2 and 4 (this being the highest rating on the scale).

**Chart 14**
Index of quality of life reported by community

| Variable | Obs | Mean | Std. | Min | Max |
|---|---|---|---|---|---|
| Puerto Jiménez | 41 | 3.00 | 0.71 | 2 | 4 |
| El Coco | 54 | 3.09 | 0.76 | 2 | 4 |
| Tamarindo | 43 | 3.14 | 0.74 | 1 | 4 |
| Flamingo | 13 | 3.15 | 0.80 | 2 | 4 |
| Golfito | 40 | 3.23 | 0.77 | 1 | 4 |
| General average | 299 | 3.25 | 0.73 | 1 | 4 |
| Quepos | 37 | 3.43 | 0.65 | 2 | 4 |
| Herradura | 70 | 3.53 | 0.61 | 2 | 4 |

**Source:** Own elaboration from information collected, 2018.

The average quality of life reported by respondents is 3.25 points. In four communities, the average quality of life perceived is below the general average: Puerto Jiménez (3.0), El Coco-Papagayo (3.09), Tamarindo (3.14) and Flamingo (3.15). While Golfito is located in the global average (3.23) and Quepos and Herradura report levels of satisfaction with their quality of life above the general average (with 3.34 and 3.53 respectively.

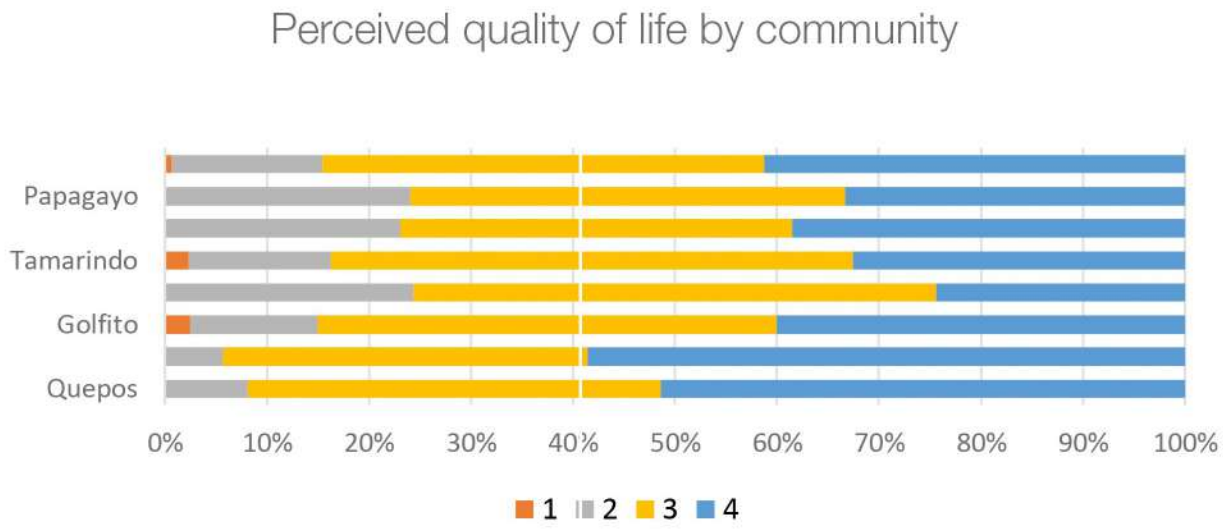



Figure 19. Quality of life reported by the community
Source: Own elaboration from information collected, 2018.

## SPORT AND CHARTER FISHING INFRASTUCTURE AND QUALITY OF LIFE

The communities that reported better quality of life indexes are communities with better charter and sports fishing infrastructure conditions, mainly marinas and some types of pier facilities. For example, the living conditions of respondents living in Herradura and

Quepos are different from those living in communities without marinas.

Likewise, the perception of satisfaction with this type of infrastructure is linked to the increase in the quality of life of this population. In this same line, the assessments conducted in relation to the tourism infrastructure in each of the sites should be analyzed in greater depth in the quality of life model in order to infer whether or not there is a relationship with the quality of life of the people and their families.

## PERCEPTION OF RESOURCE AVAILABILITY AND QUALITY OF LIFE

In general, the perception of an increase of all species consulted has a positive impact on the quality of life of respondents and their families. For the sport and charter fishing sector, there are species that are of particular interest given the demand by tourists, namely Sailfish, Marlins and Yellowtail Tuna. Because of this, there is a close relationship between the availability of this resource and the perception of wellbeing.

There is a relationship between the perception of a decrease of these species and the detriment of the quality of life of this population. This affirms the importance of these species for the dynamics of the sport and charter fishing activity on the Pacific coast and nearby communities.

## TRAINING AND QUALITY OF LIFE

The quality of life is affected by the training variable; Interestingly, the result was not significant depending on the educational level. Respondents seem to have a better quality of life when they have received some training from state institutions. This, in addition to the information analyzed, indicates that there are individuals within the sector who have specialized in the trade and that this specialization may have improved their income and quality of life.

# RECOMMENDATIONS

**Chart 15**
Recommendations to the competent institutions on sport and charter fishing in Costa Rica

| | |
|---|---|
| INCOPESCA | Build a research program in sport fishing. There is an important information gap in this topic and according to the available information, only the species for commercial fishing are considered.<br><br>This would be a great contribution for the sector since their quality of life is sensitive to changes in the resource they use. Having information on the situation of important fishing resources for sport and charter fishing would help the promotion of measures to strengthen the same. |
| INA | Strengthen the training programs related to sport and charter fishing to guarantee access to the institutional offer in different parts of the country.<br><br>Implement new programs that meet the training needs of the sector according to the market<br><br>This would provide the sport and charter fishing sector with clear conditions (as seen in the analysis of this research) to improve the quality of life of the population working in this sector. |

ICT

Promote specific locations for the strengthening, development and investment in sport and charter fishing infrastructure. There is an important relationship between the quality of life and infrastructure, which has the opportunity to be enhanced.

In addition to the above, being this activity important for coastal communities, the promotion of the activity at national and international level could be a mechanism to achieve better living conditions in those areas.

The sport and charter fishing activity must go hand in hand with the country position, where the promotion of the activity as sustainable tourism through a program is a necessity to keep the activity within this vision.


PELAGIC
WHERE THE WORLD COMES

# BIBLIOGRAPHY

CIMAT/ICT. (2011). Estudio del perfil del turista que practica pesca deportiva y turística. San José.

ICT. (2015). Anuarios Estadísticos de Turismo. Obtained from http://www.ict.go.cr/es/estadisticas/informes-estadisticos.html

INEC. (2018). Data bases on line.

IICE-UCR y TBF. (2010). Análisis de la contribución económica de la pesca deportiva y comercial a la economía de Costa Rica. San Pedro, Costa Rica.

FECOP. (2015) Estudio sobre el aporte de la pesca turística y deportiva a la economía local, Golfo Dulce, Puntarenas, Costa Rica.

Soto, A.; Yong, M.; Gutiérrez, A.; Fernández, C.; Lücke, R.; Rojas, F. y González, G. (2010). Un análisis de la Contribución Económica de la Pesca Deportiva y Comercial a la Economía de Costa Rica. Informe final. Instituto de Investigaciones en Ciencias Económicas de la Universidad de Costa Rica bajo el patrocinio de The Billfish Foundation. San José. Ciudad Universitaria Rodrigo Facio.

The World Travel & Tourism Council. (2018). Anuarios estadísticos de turismo para Costa Rica.


FECOP

FEDERACIÓN COSTARRICENSE DE PESCA