Tourism and sustainability:

A social network analysis and stock analysis of (shell)fish in Andalusia, Spain

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Abstract

International tourism has been growing on a world scale. Resource demands of tourism can have severe impacts on local communities and their surrounding environment. In Andalusia in Spain, tourism has grown tremendously over the last years and this region is important to the European (shell)fish industry. Tourism may have its impact on local social networks and fish resources. Social networks of the fish industry are not coupled to tourism before

This research uses both a social network analysis and fish stock analysis to identify possible correlations between tourism and social networks in the fish industry, as well as on the fish stocks of sardine, anchovy and prawn. It uses a survey methodology and statistical analysis.

This study revealed that tourism has been growing in Andalusia, however no significant effects of tourism on social networks nor (shell)fish stocks have been found. Tourism alone may not be the main driver for social network change and local fish stocks. As this study is a pioneer in its field, additional research is needed to explain the results.

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1. Introduction

1.1 Tourism

According to the World Tourism Organization (UNWTO), international visits worldwide have risen from 675 million in 2000 to 940 million in 2010 (Hsieh & Kung 2013). Tourism is a geographical, economic and social phenomenon consisting of the temporary movement of people from one place to another (Hernández & González-Martel, 2017). Spain had around 68 million visitors in 2015, making it the world's third most visited nation after France and the United States (The Local, 2017). The tourism boom of Spain started in the 1960s because the country offered warm, sunny beaches and low prices (González & Moral, 1995).

Tourist destinations are complex systems. The complex system of tourism contains multiple actors which are related each other composing an evolving social network (Hernández & González-Martel, 2017). An external factor such as the increase of tourism may affect the interconnections in this system. Some scholars state that all forms of tourism create some form of negative impact upon the physical and socio-cultural environment in destination areas (Cánoves, Villarino, Priestley & Blanco, 2004) such as in the form of beach litter (Wilson & Verlis, 2017), tourist traffic (Janusz & Bajdor, 2013), use of resources, pollution (Garcia & Servera, 2003), increasing population density, over-development of the built environment and possibly even increasing the dependency of a host community's economy on tourism (Dodds, 2007). Despite its detrimental effects, tourism is important for national economies as it is closely linked to job creation and the development of infrastructure (Dodds, 2007). How does tourism affect social relations of people dependent on tourism for their livelihoods?

Social network analysis in tourism research is relatively new (Tran, Jeeva & Pourabedin, 2016). Various studies have been conducted on tourism and networks in the past (Baggio, Scott & Cooper, 2010 ; French, Luo & Bose, 2017; Hernández & González-Martel, 2017; Sfandla & Björk, 2013; Tran, Jeeva & Pourabedin, 2016; van der Zee, Gerrets & Vanneste, 2017; Zach & Hill, 2017). French, Luo and Bose (2017) studied social networking tourist sites to explore antecedents to the continued use of these sites and found that social capital and trust are crucial. Hernández & González-Martel (2017) studied a growing bipartite network model and constructed one that explains the rise of the supply network in a tourism destination from the beginning phases of development. Sfandla & Björk (2013) studied interactive networks and created a Tourism Experience Network (TEN), which explores how experiences are co-created. Tran, Jeeva & Pourabedin (2016) studied social networks in tourism services distribution channel and found the pattern of the network between tour operators and travel agencies; and between tour operators.

Despite of these studies, little studies have been conducted on the connection between tourism and social networks (e.g. French, Luo & Bose, 2017). Tourism networks are complex and consist of multiple possible interconnections that remain unclear. Thus, in the current trend of increasing tourism, the question how tourism affects social networks is in urgent need of research.

1.2 Fish resources

Resource demands of tourism can have severe impacts on local communities and their surrounding environment. Conflicts over fish resources are common (Voyer, Barclay, McIlgorm & Mazur, 2017). As for Spain, fish resources in specific are crucial because Spain is an EU leader regarding fisheries (Country Report, 2017). In fact, Spain is the third largest marine fish producer of Europe (Bacher, Gordoa & Mikkelsen, 2014). For the fishing industry, the region of Andalusia, southern Spain, is among those with the highest attraction of coastal tourists in the country (Country Report, 2017), resulting in a 161 billion dollar contribution to the Spanish gross domestic product in 2014 (15.2% of GDP) (Alves, Ballester, Rigall-I-Torrent, Ferreira & Benavente, 2017) .

Some of the most important fish and shellfish in the southern Spanish waters are European Anchovy (*Engraulis encrasicolus)* (Ruiz, Rincón, Castilla, Ramos & del Hoyo, 2017), sardine (*Sardina pilchardus*) and prawns (Piniella, Soriguer, & Walliser, 2008). In Andalusia, Anchovy (*Engraulis encrasicolus*) is the most important species landed (50% of total) followed by sardine (*Sardina pilchardus*) with approximately 25 percent (Fisheries and Resources Monitoring System, 2017). In the early twenties of the previous century, anchovy was fished in the whole of Alboran Sea, but since 2014, Málaga Bay[1] has been the only area where anchovy is fished throughout all the year and more than 80% of catches are located in this area (SAC and SCSA Working Group Stock Assessment, 2014).

In the last two years, several scholars have studied tourism in relation to fisheries (Lopes, Mendes, Fonseca & Villasante, 2017; Padín, Lima & Pardellas, 2016; Voyer, Barclay, McIlgorm & Mazur, 2017; Wilson & Verlis, 2017). Lopes, Mendes, Fonseca & Villasante (2017) amongst others have studied tourism as a driver of changes in fisheries and found that marine protected areas may be disturbed because of resource extraction caused by tourism. However, this study stays relatively broad. These studies focuses on marine protected areas as a whole and thus does not focus on local fish resources such as sardine, anchovy and prawn near the coast of Andalusia. Padín, Lima & Pardella (2016) have studied the relevance of fishing tourism in the development of fishing communities in Galicia, Spain and found that horizontal cooperation between tourism and fishing is a good contribution to the local development of the fishing communities. The studies of Voyer, Barclay, McIlgorm & Mazur (2017) studied resource conflicts between the fishing industry and marine tourism and found highly interconnected and mutually supportive relationships, with professional fishing providing a range of services that benefit both tourism and recreational fishing. This study was conducted in New South Wales, Australia. Wilson & Verlis (2017) studied marine debris as coupled to visitation and found that sites close to amenities had greater levels of tourist-sourced items.

However, these recent studies do not consider the effects of tourism on local fish stocks. Former studies have indicated that fish stocks in the Spanish waters are in decline (Macías, Castilla-Espino, García-del-Hoyo, Navarro, Catalán et al., 2014; Ruiz, Rincón, Castilla, Ramos & del Hoyo, 2017). For example, from field work by the Fisheries and Resources Monitoring System (FIRMS) it is reported that most sardine and anchovy stocks in seven GSAs were found to be fully exploited: about 30 percent (FIRMS, 2017). a study that may bring to the fore new issues regarding the extent of tourist impact to our marine resources.

[1] Málaga Bay is the bay closest near shore and this bay flows into the Alborán sea

Thus, especially in the case of Spain, a country that is a large fish producer and of which coastal communities have historically depended upon income from fishing (Padín, Lima & Pardellas (2016), research is needed on how coastal tourism affects both local fish resources and social networks.

1.3 Research aim and questions

This study aims to reveal the interlinkages between tourism and the social networks of people in the fish industry in Andalusia, as well as between tourism and (shell)fish stock.

Therefore, the main research question is:

What is the impact of coastal tourism on the social network and (shell)fish stock in Andalusia, Spain?

This study focuses on both social networks and fish stock, leading to the following construct of sub-questions:

Sub-questions:

How does coastal tourism affect the social network of people working in the fish industry?

How does coastal tourism affect the (shell)fish stock in Andalusia, Spain?

As for the people working in the fish industry, groups such as market vendors, fishermen and women, (shell)fish distributors are meant in this study. The hypotheses follow logically from the case study and thus will be elaborated on in the next section. .

1.4 The case study: fish industry in Andalusia, Spain

For this research, a case study is used to assess the impact of tourism on the fish industry's social network. The case study is carried out in Andalusia, a region located most south of Spain. This region is relevant for two reasons. First, because it has been subject to major increases in tourists over the last years. From the year 2000 to 2016, the tourist count in Andalusia has grown from 6,991,973 to 10,570,898 (Instituto de Estúdios Turísticos, 2017). Especially the coastal areas of Andalusia are visited throughout the year, which are most inviting for 'sun-and-sand' tourism (Sarrión-Gavilán, Benítez-Márquez & Mora-Rangel, 2015).

Second, because this region is highly active in the industry of (shell)fish. The fisheries of Andalusia operate in the Mediterranean fishing ground, an area that reaches approximately 600 km of coastline (Maya-Jariego, Ramos & del Corral, 2016). The fishing fleet of Andalusia is the second most important of all the Spanish regions, because it manages 15% of total vessels and its catches comprise of more than 20% of the total value of fishing in Spain (Piniella, Soriguer & Fernández-Engo, 2007). There are different zones in which fish and shellfish are present, of which small pelagics[2] host sardine and anchovy species (Lleonart & Maynou, 2003). Moreover, in the northern part of the Alborán Sea, the main

[2] small pelagic fish are fish close to phytoplankton in the food web

sardine spawning grounds are located off the coast of Málaga (Ramírez, Cortés, García & Carpena, 2004). This study focuses on the Alborán sea as it is the nearest sea of Andalusia that hosts sardine, anchovy and prawn.

In this study, I hypothesize that an increase in tourism could cause the social networks of cities in Andalusia that are highly subject to tourism, to become denser. The underlying thought behind this hypothesis is that interactions between people may grow due to the demands of tourism. Additionally, I hypothesize that due to increases in tourism, the marine stocks of the fish and shellfish most popular in this region, are decreased. The underlying thought for this is that tourists come to Spain in part for (shell)fish consumption. So, an increase in tourism may affect the local (shell)fish stocks negatively.

That leads us to the following hypotheses:

- ***Hypothesis 1: The social networks (based on social relations) of the treatment city (Málaga) are denser than the social network of cities control city (Torremolinos)***

- ***Hypothesis 2: The (shell)fish stock (of sardines, anchovy and prawn) is negatively affected by the increase of tourism in Andalusia from the years 2000-2015***

The study focuses on coastal cities for its data on social networks, because as we have seen before these are most important to tourism in Andalusia. This study uses a survey methodology to gather data on social networks of people in the fish industry from two cities in Andalusia, A) Málaga, which is a city with high touristic activity and 2) Torremolinos, which has low touristic activity and therefore is used as a control group. For the data on (shell)fish stock, I will use data from the Sub Committee on Stock Assessment (SCSA) which is part of the General Fisheries Commission for the Mediterranean (FAO, 2017).

1.5 Scientific and societal relevance

Tourism is increasing on a world scale. This study identifies possible impacts of tourism on social networks. The outcome of this study provides an insight in how social relations and perceptions of people working in the fishing industry may change as a result of tourism. So, this study provides new information on the economic and social effects on coastal communities in this region, who are vulnerable because of their dependency on both tourism and the fishing industry for their livelihoods.

In the scientific field, there is extensive research to be found on tourism impacts and networks (Baggio, Scott & Cooper, 2010; French, Luo & Bose, 2017; Hernández & González-Martel, 2017; Sfandla & Björk, 2013; Tran, Jeeva & Pourabedin, 2016; van der Zee, Gerrets & Vanneste, 2017; Zach & Hill, 2017) and tourism and fisheries (Lopes, Mendes, Fonseca & Villasante, 2017; Padín, Lima & Pardellas, 2016; Voyer, Barclay, McIlgorm & Mazur, 2017; Wilson & Verlis, 2017). However, these studies do not consider tourism impact on social networks nor the tourism impact on local fish stocks. Therefore, this study is relevant in the scientific field because social networks of fish industries are understudied in the fields of tourism science. Thus, the scientific relevance of this study is that this research will provide new insights in how tourism affects social networks, bringing current science closer to inclusive knowledge on relations between tourism and networks, as well as its impact on local fish stocks in Spain.

2. Methodology

2.1 Study area

Southern Spain is known for its culture revolving around fish and seafood. As is shown by Piniella, Soriguer & Walliser (2008) annual landings of fresh fish catches in Andalusia, Spain, have amounted to between 100,000 and 150,000 tonnes with an approximate value of 250 million euros per year, which amounts to 8,25 % - 12,4 % of the total landings of Spain (OECD, 2017), making Andalusia a valuable player in the Spanish fish industry. This region has been one of the most important fish and seafood producers, because of the richness of fish species in the Mediterranean sea.

2.2 Research design

2.2.1 Treatment and control

I have chosen two cities as a case study: Málaga and Torremolinos. First, these cities are chosen because they are coastal cities. As was reviewed in the introduction, coastal tourism is crucial to the Spanish gross domestic product. Coastal cities are most active in the fish industry because of their location near the sea. Second, one of the cities chosen needs to be of high touristic level and one of low touristic level. Málaga is a popular tourist destination and in 2014, this city had the highest growth in tourism, above Zaragoza (18.06%), Madrid (8.51%), Valencia (8.07%), Granada (7.26%), Cordoba (3.10%), Seville (1.69%), Barcelona (1.65%) and Bilbao (-1.61%) (MálagaTurismo). Málaga is situated in the southern part of Spain next to the Alborán sea. It is located 36.72 latitude and -4.42 longitude and having a population of 568,305 citizens, it constitutes the second largest city in Andalusia (Worldatlas, 2017). For Torremolinos, the exact numbers of tourists a year are not publicly available. Torremolinos is a smaller city located in the province of Málaga, Andalusia. It is located at the coast at 36.62 latitude and -4.50 longitude (Worldatlas, 2017). Both cities are located in Andalusia (see Figure 1), more specifically in the province of Málaga. Third, it is of importance that the cities of the two types are situated near each other, because that increases the chance of the local cuisine being alike. In this case, that makes it possible to compare these cities for the same (shell)fish types. The two cities have a mere 17 kilometers of between each other.

As Málaga is the treatment group, it was expected that the results from this group would show a significant relationship between tourism and social networks. As for the control group, Torremolinos, no significant relationship is expected for this value, as the control group is considered to have too little tourism to be of impact.

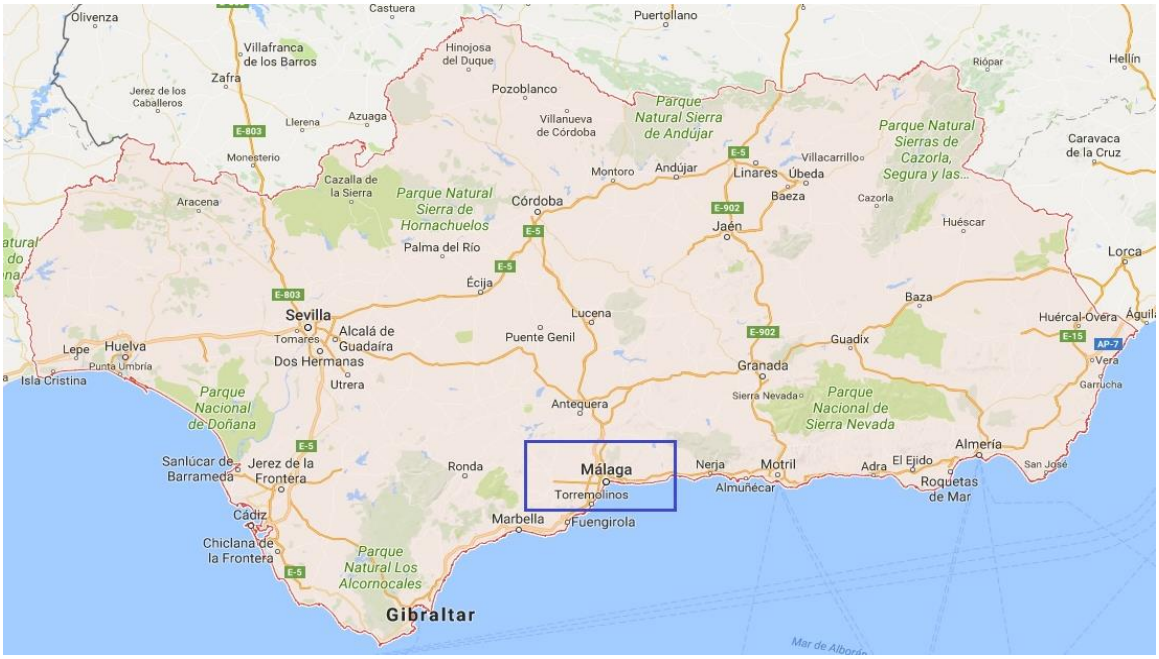

Figure 1: Location of Málaga and Torremolinos, Andalusia

2.2.2 Sampling method

As for the social network research, the survey was the sampling method of this study. This method was most suitable because it makes way for open questions (not possible through questionnaires), is easily translated from Spanish to English because the answers are short and lastly, because handing out and processing is not too time consuming in contrast to interviews. Exploratory research was held at the beginning of the field work. This consisted of a short open question to the market vendors of Málaga, in order to find out which types of fish and seafood are most popular in Málaga and its region (*Qué son los 3 pescados y mariscos lo más consumidos en Málaga y su región?)*. For this exploratory research, a sample of 36 market vendors were targeted. This number is derived from the amount of market vendors that is easily available[1] for sampling. From all answers to this question, the fish and seafood types that are mentioned the most are considered as the main fish and marine animal species to be researched further, namely: 1) Sardine (*Sardina pilchardus, called 'sardina' in Spanish)*, 2) Anchovy (*Engraulis encrasicolus, called 'boqueron' in Spanish)* and 3) Prawn. Additionally, the exploratory survey was also used to gather information on fish stocks as perceived by the market vendors.

After this, the survey was handed out to people in the fish industry working in Málaga and Torremolinos, whereas Málaga is considered a city with high touristic level (treatment) and Torremolinos is of low touristic activity (control). The control is Torremolinos that hosts less tourists than Málaga. Therefore, it was expected that Torremolinos would have a significantly lower impact of tourism on the social networks of the respondents than Málaga would have. In total, 39 samples are taken for Málaga and 42 for Torremolinos, making a total of 81 samples. For Málaga, this has resulted in 16 samples from the Market vendors, 14 from the

restaurants/cafés and 9 from the fishermen and women. For Torremolinos, this has resulted in 14 samples from the market vendors, 16 from the restaurants and 12 from the fishermen and women.

For the data collection of (shell)fish stock, data was gathered from the Sub Committee on Stock Assessment (SCSA). The targeted species are *Sardina pilchardus, Engraulis encrasicolus* and *Prawn.* The SCSA is part of the General Fisheries Commission for the Mediterranean, a commission responsible for the data on fisheries from this region. As this research focuses on the region of Andalusia, and as sardines spawn off this coastline (Ramírez, Cortés, García & Carpena, 2004), data on (shell)fish from the Alborán sea was most relevant. The location and extent of this sea can be seen in Figure 2.

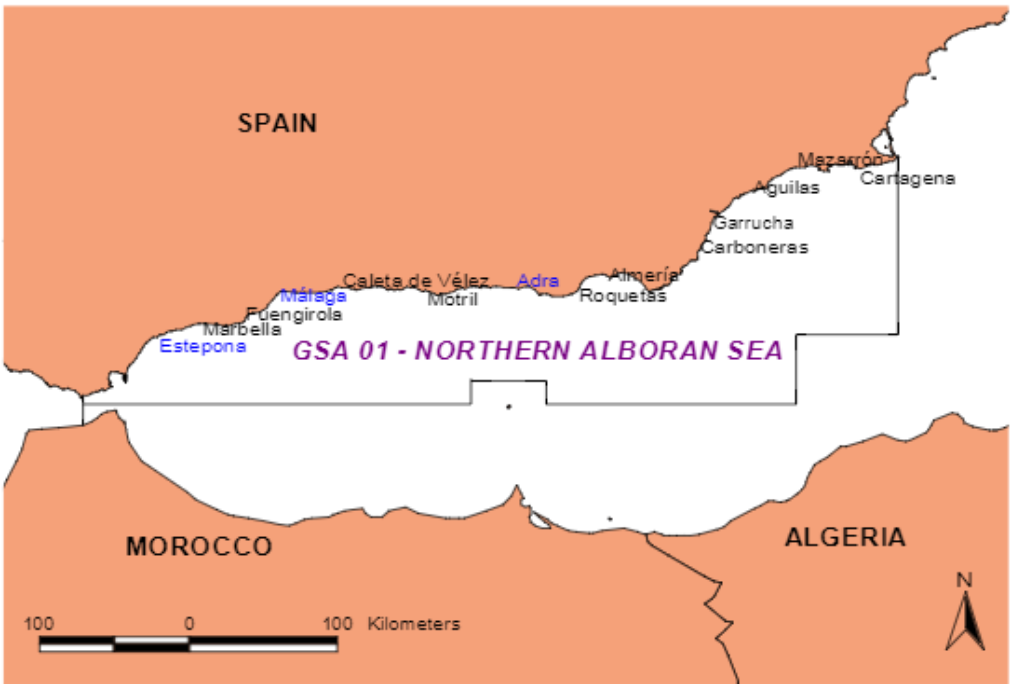

Figure 2: Location and extent of the northern Alborán Sea

2.2.3 Stakeholder groups

To represent the real populations of the targeted research groups as closely as possible, the sample sizes were aimed to reach a total of a hundred samples. Firstly, Andalusia, 25 Fishermen's Associations (‘*Cofradías’ in Spanish)* were contacted by email with the aim of obtaining relevant information regarding the fish industry in Málaga and Torremolinos. These are nearly all Fishermen's Associations[3] existent for these two cities. However, no response has been received from these associations. Secondly, 82 samples were successfully taken from three categories of people within the two targeted cities, namely 1) Market vendors, 2) Fishermen and women and 3) Restaurants and cafés.

[3] clarification: the market vendors are open every day of the week except for Sundays and therefore easily available for sampling

These stakeholder groups were chosen for the social network research because 1) they are all connected to (and some even dependent on) tourism for their income and 2) are active participants in the fish industry, which both are necessary as this study aimed to find the impact of tourism on the social network of people working in the fish industry. Moreover, the main criteria for these people to be a viable respondent are that they should 1) be involved in the fish industry in Andalusia, mostly in sales, distribution or acquiring fish and seafood, and 2) should have worked in this industry and location at least from the year 2010 onward. The reason behind the second criterion is that the respondents should know of the fish industry sufficiently so as to provide trustworthy answers to the survey questions. Therefore only market vendors, restaurants and cafés are chosen that sell fish and/or seafood.
For the fish stock research, the stakeholders are tourists in Andalusia. Data on the amounts of tourists in Andalusia were derived from the Instituto de Estudios Turísticos (IET). As the exploratory research showed, the relevant research subjects of (shell)fish are sardine, anchovy and prawn. Data on these amounts are derived from the reports 'Stock Assessment Form Small Pelagics' (Reference Year: 2015, Reporting Year: 2016) for sardine, the 'Stock Assessment Form Small Pelagics' (Reference Year: 2014, Reporting Year: 2015) for anchovy and the 'FAO Yearbook. Fishery and Aquaculture Statistics. 2014' for prawn. The next section elaborates on these reports in depth.

2.2.4 Data collection

First, the data collection for the social network analysis is outlined. The survey was constructed based on several themes. The survey questions were categorized according to their variables (see Table 1 below). The data that are extracted from these questions are mostly the sectors with which the respondents are in contact and the amount of contact the respondents are in contact with these groups per month.

Table 1. Categorization of survey questions for network analysis

Category	Explanation	Survey question(s)*
Sex	Male/female	P1
Age	Age in years	P2
Profession	Profession	P3
Function	Main function of the job	P4
Sectors	Contact with other sectors	P5
Contact means	Means of contact	P5a
Motive	Main reason for contact	P5b
Most contact	Group contacted most	P6

Most contact month	**Amount of monthly contact with group contacted most**	**P7**
Monthly contact P/D/M/RC	**Amount monthly contact fishers, distributors, market vendors and restaurants/cafés**	**P8**
Other contacts	**Other contact group(s)**	**P9b**
Monthly contact others	**Monthly contact with the other group(s)**	**P10**

***not all questions are relevant for social network analysis. These are not included here.**

To safeguard the anonymity of the respondents, they are numbered instead of providing their real names. Furthermore, they are grouped according to their function and the city they work in. The coding can be viewed in Table 2 below.

Table 2: Grouping and coding of survey respondents

Group	Code
Market vendors Málaga	MM
Restaurants/cafés Málaga	MRC
Fishermen/women Málaga	MF
Market vendors Torremolinos	TM
Restaurants/cafés Torremolinos	TRC
Fishermen/women Torremolinos	TF

The first 'M' and 'T' in the code represent the name of the city, whereas the following 'M', 'RC' and 'F' represent their groupings market vendors, restaurants/cafés and fishermen/women. All responses were inserted in Excel and summarized in another Excel sheet. These Excel sheets can be found in the Appendix under section B and C.

The answers to the questions *'With which sectors are you in contact with?'* were gathered to find out how the connections to these sectors change after our treatment, tourism. The density of the links between the nodes was measured by asking the respondents about how tourism has affected their contact with other sectors. The answers to these questions were transformed from being answers of a scale from 0 – 10 (0 being detrimental impact to contact and 10 being beneficial to contact) to answers being ordinal, whereas category 1 [0-

5] means a sparser network, [5] being no effect to the network and [6-10] resulting in a denser network. These data lead us to get information on what the network consists of for Málaga (treatment group) and Torremolinos (control group). The responses to the question *'How did tourism affect your contacts in period 1 [2014-2017], 2 [2007-2014] and 3 [1992-2007]?* provided us with the data on the impact of tourism for the respondents in both cities.

Then, so as to be able to identify the social networks, the data was transformed into binary codes. Here, the binary code '0' represented an answer between 0 - 5, the code '1' representing the answer 5 (contact with the sectors remained the same) and the code '2' representing the responses 6-10 (contact with sectors increased due to tourism). These binary sheets can be found in the Appendix under section D and E.

Second, for the data collection of (shell)fish stock, data for *Sardina pilchardus* and *Engraulis encrasicolus* were gathered from the Sub Committee on Stock Assessment (SCSA). The measure for fish stock in this study was 'capture'. This measure was used by former scholars such Free, Jensen, Wiedenmann & Deroba (2017). Biomass is considered as a relevant measure for fish stock, however, as data on biomass is limited for the (shell)fish in the Alborán Sea, only capture was used as a measure.

For sardine, the report 'Stock Assessment Form Small Pelagics' (Reference Year: 2015, Reporting Year: 2016) was used because it provided the most contemporary data. The region that refers to the Alborán Sea is 'GSA01' (Northern Alborán Sea) in these series of reports. This report provided the annual catches of sardine for only 2002-2015 for GSA01. Reasons were not provided. Therefore, this data was limited to 2002-2015.

For anchovy, the report 'Stock Assessment Form Small Pelagics' (Reference Year: 2014, Reporting Year: 2015) was used. This report provided the annual catches of anchovy in tonnes from the Alborán Sea, from 1990-2014.

For prawn, the report 'FAO Yearbook. Fishery and Aquaculture Statistics. 2014' was used, because the SCSA did not research and report the catches for prawn. This report provided the statistics for 'Capture production by species, fishing areas and countries or areas'.

It should be noted that the prawn data is from a different source than the data for sardines and anchovy. The SCSA does not conduct fish stock assessment for prawns. Therefore, data from the FAO is used (FAO, 2017). This data shows the total capture of prawn from the Mediterranean and Black Sea. Although the Alborán Sea is more specific and relevant for the people working in Málaga and Torremolinos, the data for prawn is still useful.

The data on tourism in Andalusia was derived from the 'Instituto de Estudios Turísticos (IET). Ministerio de Industria, Turismo y Comercio and INE, made public on Andalucia.com (2017).This data was used as they were, as scale variables with each value representing a year between 2000-2015. These data can be found in the Appendix under section F.

2.2.4 Data analysis

First, we tested whether tourism in Andalusia has significantly increased over the years. To do so, we used a Spearman's rho test. We used a one-tailed test as the assumption is that the answer would be a positive relation (years higher resulting in higher tourism).

We have examined the correlation between the three timeslots (Period 1 = [2014-2017], Period 2 = [2007-2014] and Period 3 = [1992-2007]). We used Spearman's rho, because it examines whether there is a significant relationship between two variables: time and change in contacts. This measure can be used because at least one of the variables is ordinal. In this case, both variables are ordinal because Time is tested in categories, namely Period 1, Period 2 and Period 3, and categorized in either 'lower', 'the same' or 'higher' contacts due to tourism in period X'. For both Málaga and Torremolinos we conducted this analysis for the correlation between time and impact on tourism. A one-tailed test was chosen, because the assumption is that the direction of the correlation would be negative (the higher the number for period/the further back in time, the lower the impact of tourism on contact).

To examine the relationship between tourism and (shell) fish stock for sardine, anchovy and prawn. A Pearson correlation test was chosen because variables obeyed normality. Therefore we use a Pearson correlation for these tests. A one tailed test because the assumption is that when the value for tourism increases, the capture decreases (a negative relationship).

We conducted these analyses in SPSS Statistics 24, 9 September 2017 at Utrecht University in the Netherlands. After data gathering, the social network data will be analyzed for correlations using the program SPSS Statistics 24, then transferred to binary data and analyzed using UCINET 6.

2.2.6 Reliability and validity

The real amount of people working in the fish industry in Andalusia, Spain, is not made public. Therefore, this study aimed to gather a 100 samples for statistical analysis. In total, 82 samples were gathered. Survey sampling can be seen as a valid measure for testing However, the survey questions are open to (mis)interpretation. The survey questions are in part consistent of opinions of people, which may be flexible and could change over time due to new experiences or motives. As the respondents were able to answer anonymously and with their knowledge that this information would not be publicly available with their (company) names attached, it is assumed that respondents answered truthfully and thus internal validity is safeguarded.

Reliability is safeguarded because this research can be replicated in other situations, e.g. other cities, regions or with other groups of research participants. Also, for social network analyses, the same survey methodology and analysis with SPSS can be used. However, it is taken into account that it is likely that respondents in other regions may respond differently not only because tourism may have different impacts, but also because impacts may be perceived differently. Moreover, this study is focused on specific groups of people, in two cities in Andalusia. This makes the data of this study limited. Therefore, this study can be

generalized for coastal cities in region of Andalusia, but not for generalization beyond, restricting external validity.

As for the fish stock analyses, the research is reliable when the same sardine, anchovy and prawn databases are used for testing, because this allows for replicating and reusing data that is fixed. Capture is considered as the determinant for fish stock in this study, because of limited data on capture and biomass for the species sardines, anchovy and prawn.

The data on the amounts of tourists and the data on fish amounts have a normal distribution. Thus, this study has high internal validity and limited external validity because of its focus on a limited region and groups of research participants.

3. Results

3.1 Social network

Our results show that high tourism results with a network with higher number of connections but less dense, as nodes and links are situated further away. These results can be observed in figures 3 and 4.

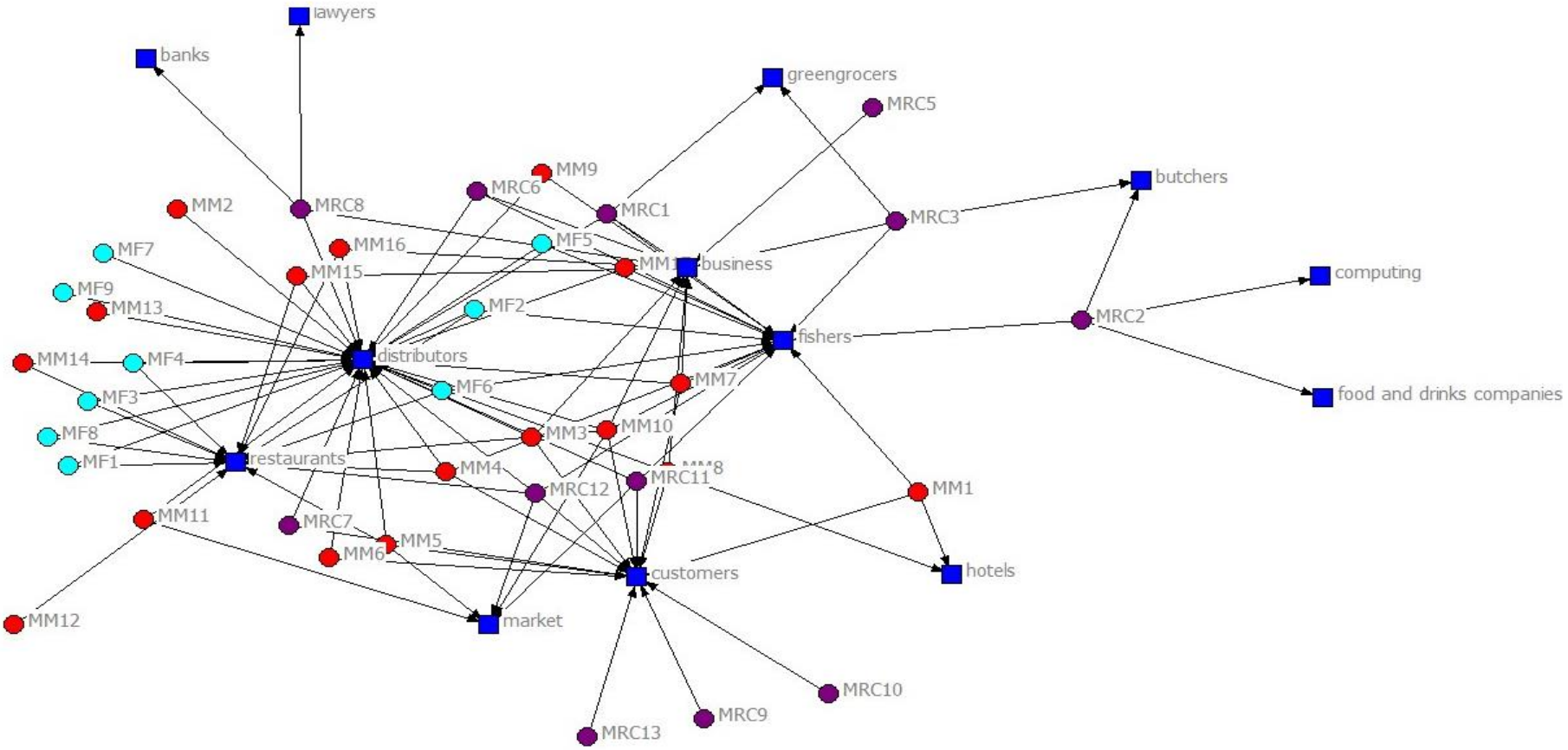

Figure 3: Visualization of the social network of the respondents for Málaga

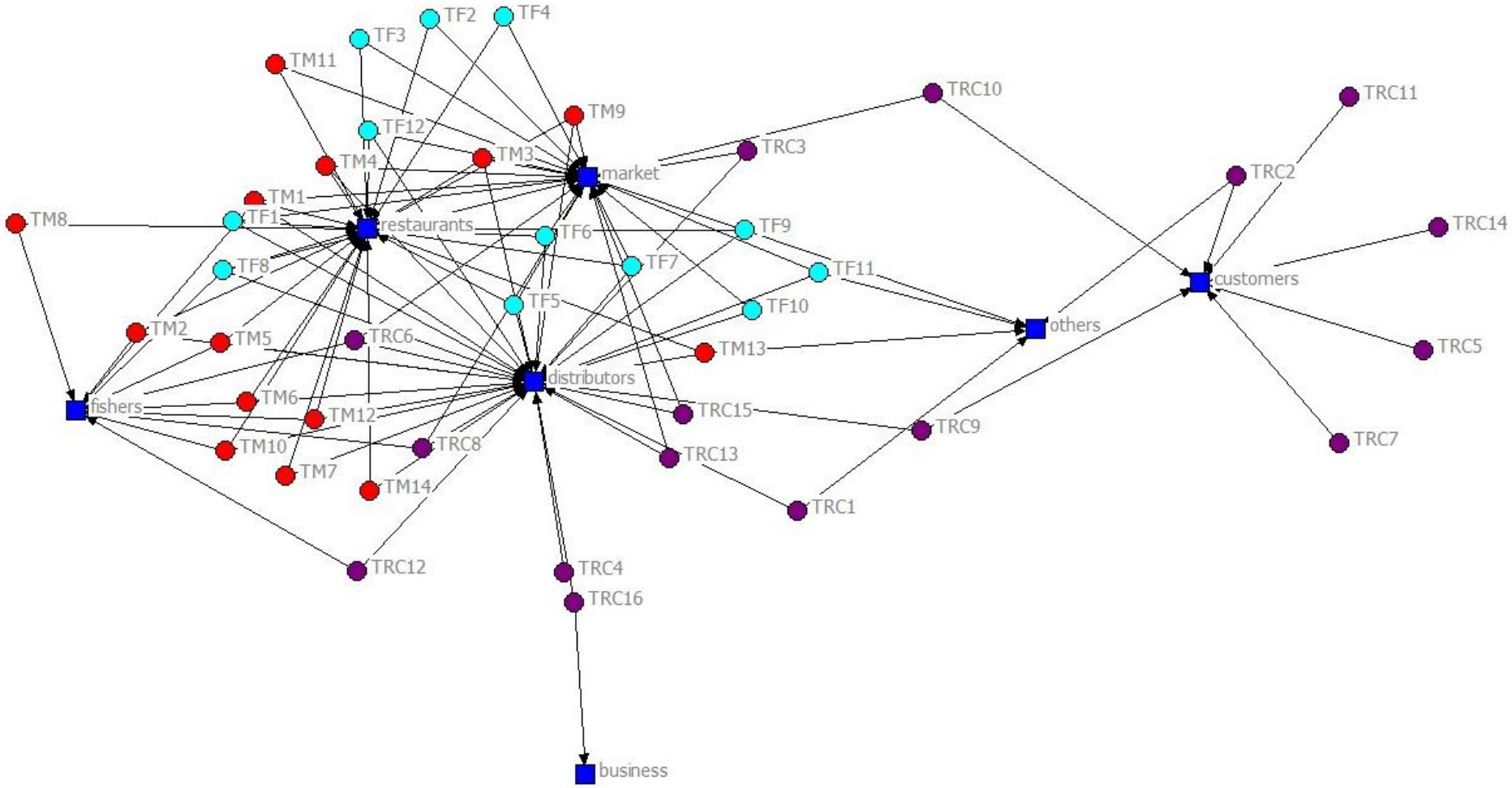

Figure 4 : Visualization of the social network of the respondents for Torremolinos

From figure 3 and 4 we can see that the network for Torremolinos, the control group, is denser than that for Málaga, as the nodes and links are situated closer to each other. Málaga, the treatment group, is in contact with more sectors than Torremolinos, resulting in a sparser network with 13 sector nodes for Málaga and 8 sector nodes for Torremolinos. .

For statistical analysis of tourism, we used the Spearman's rho test to identify whether tourism in Andalusia has significantly increased over the years. Tourism in Andalusia significantly increased in the last 15 years. The Spearman's Rho test showed a correlation of ,444 with a p value = 0,037, which is lower than 0,05.

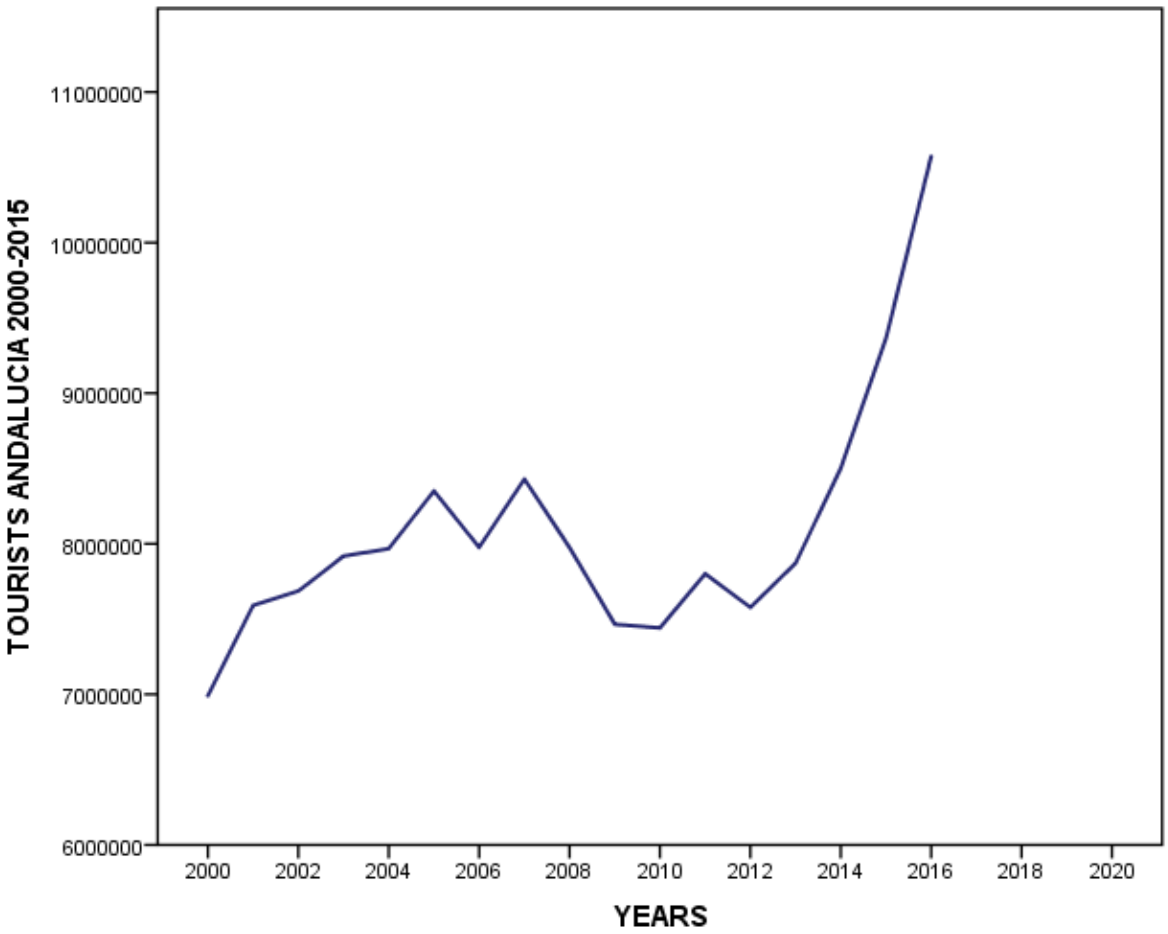

Figure 5: Tourists in Andalusia 2000-2015. Source: INE Instituto Nacional de Estadística

Spearman's rho was used to test the correlation between time and impact of tourism on contacts of the respondents for the treatment group. The correlation coefficient for the variables Time and Impact Contact for Málaga is -,062. This is a negative value, which would suggest that the further we go back in time (Period becoming a higher number), the lower the impact of tourism on contacts becomes (answers being of category 1 or 2). However, this correlation coefficient has a significance of 0,254. Because the value exceeds 0,05, we conclude that we cannot reject the null hypothesis (no significant relationship between the variables). Therefore, the conclusion is that there is no significant relationship between time and the impact of tourism on contact of the people in Torremolinos.

For the control group, the correlation coefficient of the Spearman's rho test is -,015. This is a negative value, which would suggest that the further we go back in time (Period becoming a higher number), the lower the impact of tourism on contacts becomes. However, this correlation coefficient has a significance of 0,436. Because the value exceeds 0,05, we conclude that we cannot reject the null hypothesis (no significant relationship between the variables). Therefore, the conclusion is that there is no significant relationship between time and the impact of tourism on contact of the people in Torremolinos.

3.2 Fish stock

The values for the Pearson correlations for sardine and anchovy were negative (-,151 and -,094), whereas the correlation for prawn was positive (,275). The Sig's for the Pearson tests for sardine, anchovy and prawn are ,304 ,370 and ,221 respectively, which are all exceeding 0,05. Therefore, the null hypothesis (no significant relationship between tourism and the fish resource) could not be rejected.

4. Discussion

This study researched the impacts of tourism in Andalusia on social networks of people in the fish industry and fish stocks for sardine, anchovy and prawn.

A significant positive relationship has been found between the passing years and the increased amount of tourists in Andalusia, Spain, as was expected. Various references have indicated that tourism in Andalusia, Spain has been growing and this has been verified.

For Torremolinos, the control group, it was expected that there was no significant relationship between tourism and the social network, because tourism was considered too small for that city. The statistical analysis for this group also resulted in lacking significant impact of tourism on contacts. However, for Málaga, the treatment group, it was expected that tourism would have a significant impact on the social networks. The statistical analysis for Málaga has resulted in a lack of significant impact of tourism on contacts as well. There was no statistical support that tourism has either a detrimental or beneficial impact on contacts of the fish industry people of Málaga. Thus, the answer to the sub question *How does coastal tourism affect the social network of people working in the fish industry?* is that effects of tourism on social networks were not found. This suggests that tourism is not a critical determinant of the social network for people in the fish industry in this region. As this research is a pioneer in the study of tourism and social network of people in the fish industry, it is hard to find an explanation for this phenomenon in former studies. This opens doors for additional research on possible drivers of the social networks. However, the networks of the control groups are different in density.

As for fish stocks in the Alborán sea, increase in tourism did not have a significant impact on the fish stocks for sardine, anchovy as well as for prawn in the Mediterranean and Black Sea. So, the answer to the sub-question '*How does coastal tourism affect the (shell)fish stock in Andalusia, Spain?'* is that coastal tourism has been growing in Andalusia, however, no significant effect on (shell)fish stock has been found. This is an interesting result for the scientific field. As tourism is considered a negative influence for marine resources by

scholars studying these correlations in the recent years (e.g. Lopes, Mendes, Fonseca & Villasante, 2017), this research does not provide evidence for that. From this case study follows a new possibility that tourism is not the main pressure for fish resources in the Alborán Sea. Other possible, stronger pressures could be local consumption of fish resources. Therefore, it is recommended that future studies assess the pressures of local consumption for fish resources, as opposed to consumption by tourist.

Limitations

This study used capture as a variable for fish stock. This study considered using biomass as a determinant, but because thesis focuses on the region of the Alborán sea in specific, it showed in the databases that data on biomass for sardine, anchovy and prawn was limited. Therefore, it was considered best to choose capture as this provided sufficient data on these specific region. However, in the field of fish stock research, it is debatable what variables for fish stock are most relevant. Pauly, Hilborn & Branch (2013) state in their research that the main difficulty is that a low catch compared with previous records does not necessarily mean fewer fish in the sea. According to Cook (2013), recorded catch by fishers is often distorted by actions to circumvent regulations and that may in turn result in a variable bias in recorded catches may undermine the veracity of any assessment. Therefore, this study recognizes the limitation of using only capture as a determinant for stock. It is recommended to future scholars to combine capture with other determinants of fish stock, such as biomass.

Additionally, it should be noted that only the prawn data is from a different source than the data for sardines and anchovy. The SCSA does not conduct fish stock assessment for prawns. Therefore, the data from the FAO is used. This data shows the total capture of prawn from the Mediterranean and Black Sea. Although the Alborán Sea is more specific and relevant for the people working in Málaga and Torremolinos, there may be differences between areas that are not considered. Thus, this study recommends that future scholar use even more data sources to safeguard internal validity.

I want to conclude this section with other new research topics that could be interesting in line with this study. Climate change is considered an important driver of environmental change. The changing climate could affect average temperatures, the frequency of very cold or hot seasons and pH, which in turn can affect physiology, behavior and population dynamics of species, and hence affect ecosystems (FAO, 2011). This topic is crucial for future generations and I would recommend scholars to study the interlinkages between climate change and fish stock. Additionally, there may be a correlation between the policy and the change in fish stock that may have been overlooked. Pressure from the EU on fishers may affect fish capture. The state of fish stocks differs per sea. The European Common Fisheries Policy that has assisted in improving the state of NE Atlantic fish stocks in the past 10 years has failed to deliver similar results for Mediterranean stocks managed under the same policy (Vasilakopoulos, Maravelias & Tserpes, 2014). Could this difference in fish stock have to do with a different execution of policy? This is an important research topic that should be studied in the future.

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Appendix

A) Survey (in Spanish)

Encuesta sobre las redes sociales en la industria pesquera del sureste de España
Universidad de Utrecht, Países Bajos
Participante/nombre de la empresa: _____
P1. ¿Cuál es su género?P2. ¿Cuál es su edad?
____

- Varón
- Mujer

P3. ¿Cuál es su profesión?
_____
P4. ¿Qué tareas desempeña usted dentro de su profesión?
_____
P5. ¿Con que sectores de gente/negocios está usted en contacto por motivos profesionales? ¿Puede enumerar abajo los grupos de gente con los que está en contacto (por ejemplo, pescadores, distribuidores, comerciales…)?
1._____
2._____

3._____

4._____

P5.a ¿A través de qué medios está usted en contacto con estos grupos (teléfono, correo electrónico, contacto en persona, etc.) ?

_____

P5.b ¿Puede indicar por que motivo se comunica mayoritariamente con cada grupo?

_____

_____

_____

_____

_____

P6. ¿Con cuál de estas profesiones tiene usted más contactos de tipo profesional?

- Pescadores/oras
- Distribuidores de pescado
- Responsables de ventas (por ejemplo, gente que trabaja en el mercado)
- restaurantes/cafeterías
- otros: _____

P7. ¿Cuantas veces al mes está usted en contacto con gente perteneciente a los grupos de la pregunta anterior por motivos profesionales? (en referencia a los grupos de la pregunta 6).

_____

P8. ¿Cuantas veces al mes está usted en contacto con otros grupos de gente a nivel profesional?

Contacto con pescadores/oras:

_____

Contacto con distribuidores de pescado:

_____

Contacto con responsables de ventas:

_____

Contacto con restaurantes/cafeterías:

_____

P9. ¿Aparte de los grupos citados hasta ahora, está usted en contacto con otros grupos de personas a nivel profesional?

- Si
- No (en este caso, salte a la P11)

P9b. ¿Con que otros grupos mantiene usted contacto? Indíquelos en la siguiente lista.

1. _____ 6. _____
1. _____ 7. _____
1. _____ 8. _____
1. _____ 9. _____
1. _____ 10. _____

P10. ¿Cuantas veces al mes está usted en contacto a nivel profesional con los grupos de gente que usted ha citado en la P9b?

1. _____ 6. _____
1. _____ 7. _____
1. _____ 8. _____
1. _____ 9. _____
1. _____ 10. _____

P11a. ¿En una escala del 0 al 10, cree usted que el turismo en el litoral tiene un impacto perjudicial (0) o beneficioso (10) para su ingresas durante el período 2014 – 2017?

0 1 2 3 4 5 6 7 8 9 10

P11b. ¿Puede explicar el porqué de su respuesta en la P11?

_____
_____
_____
_____

P12a. ¿En una escala del 0 al 10, cree usted que el turismo en el litoral tiene un impacto perjudicial (0) o beneficioso (10) para su ingresas durante el período 2007 – 2014?

0 1 2 3 4 5 6 7 8 9 10

P12.b ¿Puede explicar el porqué de su respuesta en la P12a?

_____
_____
_____
_____

P13a. ¿En una escala del 0 al 10, cree usted que el turismo en el litoral tiene un impacto perjudicial (0) o beneficioso (10) para su ingresas durante el período 1992 – 2007?

0 1 2 3 4 5 6 7 8 9 10

P13b. Puede explicar el porqué de su respuesta en la P13a?

_____
_____
_____
_____

P14a. ¿En una escala del 0 al 10, cree usted que el turismo ayuda a disminuir (0) o a aumentar (10) las conexiones que usted tiene entre la industria pesquera durante el período 2014 – 2017?

0 1 2 3 4 5 6 7 8 9 10

P14b. ¿Puede explicar el porqué de su respuesta en la P14a?

_____
_____
_____
_____

P15a ¿En una escala del 0 al 10, cree usted que el turismo ayuda a disminuir (0) o a aumentar (10) las conexiones que usted tiene entre la industria pesquera durante el período 2007 – 2014?

0 1 2 3 4 5 6 7 8 9 10

P15b. ¿Puede explicar el porqué de su respuesta en la P15a?

_____
_____
_____
_____

P16a. ¿En una escala del 0 al 10, cree usted que el turismo ayuda a disminuir (0) o a aumentar (10) las conexiones que usted tiene entre la industria pesquera durante el período 1992 – 2007?

0 1 2 3 4 5 6 7 8 9 10

P16b. ¿Puede explicar el porqué de su respuesta en la P16a?

_____
_____
_____
_____

P17a. ¿En una escala del 1 al 5, hasta qué punto cree usted que el turismo en el litoral ha contribuido a reducir o aumentar el stock de pescado (boqueron, sardina y gamba) durante el periodo 2014-2017?

Boqueron:

1 2 3 4 5

(reducción importante - reducción menor - ningún efecto - aumento menor - aumento importante)

Sardina:

1 2 3 4 5

(reducción importante - reducción menor - ningún efecto - aumento menor - aumento importante)

Gamba:

1 2 3 4 5
(reducción importante - reducción menor - ningún efecto - aumento menor - aumento importante)
P17b. ¿Puede explicar el porqué de su respuesta en la P17a?
_____ _____ _____ _____
P17c. ¿Estos cambiós en el stock, de qué manera le afectan? Es diferente por periodo?
_____ _____ _____ _____ _____ _____
P18a. ¿En una escala del 1 al 5, hasta qué punto cree usted que el turismo en el litoral ha contribuido a reducir o aumentar el stock de pescado (boqueron, sardina y gamba) durante el periodo 2007-2014?
Boqueron:
1 2 3 4 5
(reducción importante - reducción menor - ningún efecto - aumento menor - aumento importante)
Sardina:
1 2 3 4 5
(reducción importante - reducción menor - ningún efecto - aumento menor - aumento importante)
Gamba:
1 2 3 4 5
(reducción importante - reducción menor - ningún efecto - aumento menor - aumento importante)
P18b Puede explicar el porqué de su respuesta en la P18a?
_____

_____
_____
_____

P19a. ¿En una escala del 1 al 5, hasta qué punto cree usted que el turismo en el litoral ha contribuido a reducir o aumentar el stock de pescado (boqueron, sardina y gamba) durante el periodo 1992-2007?

Boqueron:

1 2 3 4 5

(reducción importante - reducción menor - ningún efecto - aumento menor - aumento importante)

Sardina:

1 2 3 4 5

(reducción importante - reducción menor - ningún efecto - aumento menor - aumento importante)

Gamba:

1 2 3 4 5

(reducción importante - reducción menor - ningún efecto - aumento menor - aumento importante)

P19b. Puede explicar el porqué de su respuesta en la P19a?

_____
_____
_____
_____

P20. ¿Recuerda usted cambios importantes en las regulaciones en la industria del pescado durante los años 1992-2017? ¿En caso positivo, puede explicar cuáles y en que años?

_____
_____
_____
_____
_____

P21a. ¿Qué regulaciones afectan a su negocio?

_____
_____

_____ _____
P21b. ¿De qué manera le afectan?
_____ _____ _____ _____ _____
P22a. ¿Durante qué periodo ha vendido/comerciado usted más pescado en promedio por año?
Boqueron
[2014 – 2017] [2007-2014] [1992-2007]
Sardina
[2014 – 2017] [2007-2014] [1992-2007]
Gamba
[2014 – 2017] [2007-2014] [1992-2007]
P22b. ¿Por qué ha vendido más pescado en este período?
_____ _____ _____
P22c. ¿Y durante qué periodo ha vendido usted menos pescado de promedio por año?
Boqueron
[2014 – 2017] [2007-2014] [1992-2007]
Sardina
[2014 – 2017] [2007-2014] [1992-2007]
Gamba
[2014 – 2017] [2007-2014] [1992-2007]
P22d. ¿Por qué ha vendido menos pescado en este período?
_____ _____

_____
_____
P23.a ¿Durante qué periodo ha percibido usted un mayor cambio en la calidad del pescado?
Boqueron
[2014 – 2017] [2007-2014] [1992-2007] [ninguna]
Sardina
[2014 – 2017] [2007-2014] [1992-2007][ninguna]
Gamba
[2014 – 2017] [2007-2014] [1992-2007][ninguna]
P23b. ¿Qué tipos de cambios ha percibido usted en la calidad del pescado? ¿De qué manera le afectan?
_____
_____
_____
_____
P24a. ¿Las estaciones del año afectan al comercio del pescado? ¿de qué manera?
Por boqueron
_____
_____
_____
_____
Por sardina
_____
_____
_____
_____
Por gambas
_____
_____
_____
¡Muchas gracias por su colaboración!
si desea recibir los resultados de la investigación, escriba su correo electrónico aquí:

B) Summary responses survey Málaga

Category	Restaurants/Cafés Málaga	% out of total M	Marketpeople Málaga	% out of total Marketpeople	Fishers Málaga	% out of total F
P1 (=GENDER m/f)	male/female	1/14 female, 13/14 male	male/female	3/16 female, 13/16 male	male/female	100% male
P2 (=AGE)		not sufficient data			insufficient data	
P3 (=PROFESSION)	Businessman/Manager Waiter Cook	5/14 businessman/manager 8/14 waiter 1/14 cook	Fishmonger/Salesperson Fish retailer Manager Fisherman (*who sells at the market)	9x 4x 3x 1x	Fishers/Fishermen	100% fishermen
P4 (=MAIN FUNCTION)	Administration, cooking, service, cleaning, management, marketing		Buying and selling Transport Marketing Cleaning fish	17x	Fishing Selling	100% fishing and selling
P5 (SECTORS)	Fishermen; Greengrocers; Businessmen; Distributors, Tourists Food and drinks companies; Computing; Butchers; Lawyers; Banks, Public, Marketpeople, Clients	5x 2x 5x 5x 3x 1x 1x 2x 1x 1x 3x 1x 2x TOTAL = 32 responses	Fishermen; Hotel owners; Businessmen; Distributors, Public/Clients Marketpeople, Restaurants	6x 2x 9x 7x 2x 5x 3x	Fishers Distributors Restaurants Others	3x 9x 6x 1x
P5a (MEANS OF CONTACT)	All, Personal, T, T+P	3x all 6x personal 2x telephone 3x t+p	Personal P+T All	6x 9x 2x	Personal Telephone P+T PTE All	1x 0x 5x 1x 2x
P5b (MOTIVE)	Buying Service Managing Dealing with tourists and distributors	5x 5x 3x 1x	Buying and selling Pricing	17x 1x	Sales	9x

P6 (MOST CONTACT)	Fishers Distributors Marketpeople Restaurants/Cafés Others ; Customers	4x , 7x, 13x, 5x , 3x, 4x	Fishers Distributors Marketpeople Restaurants/Cafés Others ; Customers	1x 14x 6x 6x 3x	Fishers Distributors Marketpeople Restaurants	6x 9x 4x 3x
P7 (TIMES A MONTH)	All 4 times Often 24 Once a month Daily Weekly	5x 1x 1x 1x 1x 5x 1x	Daily All days 100 20 20-31 6 Every two days Often	7x 3x 1x 1x 1x 1x 1x 1x	Daily Often 20-30	6x 2x 1x
P8 (=CONTACT FISHERS D/W/M)	Daily Weekly 20 x Never	4x 3x 1x 5x (1x all the same, check this)	Daily Weekly 10 x 20 x Monthly <3x a month Never Often/Sufficient no answer	3x 1x 2x 1x 1x 1x 6x 1x 1x	Daily 20x Never	5x 1x 3x
P8 (=CONTACT DISTRIBUTORS D/W/M)	Daily Weekly 2x 20 x Never	2x 5x 2x 1x 3x	Daily 15x 20 x 30x Never Often/Sufficient no answer	9x 1x 2x 2x 1x 1x suf 1x	Daily 20x 30x Never	7x 1x 1x
P8 (=CONTACT MARKETPEOPLE D/W/M)	Daily Weekly 2x 6x 20 x Never 15x	4x 2x 1x 1x 3x 1x 1x	Daily 15x 20 x 30x Never Sometimes Often/Sufficient no answer	5x 1x 2x 2x 4x 1x 1x 1x	Daily 20x Never	3x 1x 5x
P8 (=CONTACT RESTAURANTS D/W/M)	Daily Weekly 6x 20 x Never Monthly	3x 1x 2x 2x 4x 1x	Daily Weekly 20 x 30x Never Often/Sufficient	8x 2x 3x 1x 2x 1x suf	Daily 20x Never	1x 2x 6x
P8 (=CONTACT OTHERS D/W/M)						
P9 (=OTHER GROUPS Y/N)	No Yes	10 4	No Yes	3 14	No Yes	9x

P9b (WHICH OTHERS)	Hospitality machinery Informatica, Advisory, Walking vendors, Advertising Management Hoteliers	1x 1x 1x 1x	Hotel owners Public	2 1		
P10 (X A MONTH OTHER GROUP)	Hospitality machinery Informatica, Advisory, Walking vendors, Advertising Management Hoteliers	1 4 Daily Daily Daily 4 Weekly	15-20 20 daily	1x 1x 1x		
P11a (IMPACT COMPANY 2014-2017)	10 9 8 7 5	10 1 1 1 1	10 9 8 7 6 5 3 0	6x 1x 2x 1x 2x 3x 2x 1x	10 7 6 5	2x 2x 2x 3x
P12a (IMPACT COMPANY 2007-2014)	10 9 8 7 5	10 1 1 1 1	10 9 8 7 6 5 3 0	5x 1x 1x 1x 1x 3x 3x 2x	10 7 6 5	2x 2x 2x 3x
P13a (IMPACT COMPANY 1992-2007)	10 9 8 7 0	9 1 1 1 1 1 not applicable	10 9 8 7 6 5 3 0 no answer	5x 1x 1x 0x 0x 3x 2x 2x 1x	10 7 6 5	2x 2x 2x 3x
P14a (IMPACT CONTACT 2014-2017)	10 7 5 0	6 2 4 1 1 not applicable	10 9 8 7 6 5 4 3 2 1	0x 1x 2x 0x 2x 7x 0x 2x 0x 1x	5	9x

P15a (IMPACT CONTACT 2007-2014)	10 7 5 0	6 2 5 1	10 9 8 7 6 5 4 3 2 1	0x 0x 1x 0x 3x 5x 0x 2x 0x 0x	5	9x
P16a (IMPACT CONTACT 1992-2007)	10 9 7 5 0	6 1 1 4 1 1 not applicable	10 9 8 7 6 5 4 3 2 1 No answer	1x 0x 1x 0x 1x 2x 1x 2x 0x 0x 3x	5	9x
P17a (FISH STOCK 1-5 B/S/G 2014-2017) BOQUERON	5 4 3 2	5x 2x 5x 2x	5 4 3 2 1	4x 2x 10x 0x 1x	5 3	2x 7x
P17a (FISH STOCK 1-5 B/S/G 2014-2017) SARDINA	5 4 3 2	4x 2x 6x 2x	5 4 3 2 1	4x 2x 10x 0x 1x	5 3	2x 7x
P17a (FISH STOCK 1-5 B/S/G 2014-2017) GAMBA	5 4 3 2	4x 3x 5x 2x	5 4 3 2 1	2x 1x 11x	5 3	2x 7x
P18a (FISH STOCK 1-5 B/S/G 2007-2014) BOQUERON	5 4 3 2	6x 1x 5x 2x	5 4 3 2 1	2x 3x 10x 0x 1x	5 3	2x 7x
P18a (FISH STOCK 1-5 B/S/G 2007-2014) SARDINA	5 4 3 2	6x 1x 5x 2x	5 4 3 2 1	2x 3x 10x 0x 1x	5 3	2x 7x
P18a (FISH STOCK 1-5 B/S/G 2007-2014) GAMBA	5 4 3 2	5x 2x 5x 2x	5 4 3 2 1	2x 1x 9x 1x 1x	5 3	2x 7x
P18b (18aEXPLAIN)						

P19a (FISH STOCK 1-5 B/S/G 1992-2007) BOQUERON	5 4 3 2	5x 2x 6x 1x	5 4 3 2 1	2x 2x 9x 0x 1x	5 3	2x 7x
P19a (FISH STOCK 1-5 B/S/G 1992-2007) SARDINA	5 4 3 2	5x 2x 6x 1x	5 4 3 2 1	2x 2x 9x 0x 1x	5 3	2x 7x
P19a (FISH STOCK 1-5 B/S/G 1992-2007) GAMBA	5 4 3 2	5x 1x 7x 1x	5 4 3 2 1	2x 4x 9x 2x 1x	5 3	2x 7x
P22a (SOLD MOST a/b/c) BOQUERON	A ALL	7x 6x 1x no answer	A B C ALL not answered other answer	5x 2x 5x 1x 1x Other: Boqueron: may to august - May to august - nothing, Sardina May to August, May to august, nothing, Gamba december, december, nothing	A All the same	4x 5x
P22a (SOLD MOST a/b/c) SARDINA		7x 6x 1x no answer	A B C ALL not answered other answer	5x 2x 5x 1x 3x 1x (M9)	A All the same	4x 5x
P22a (SOLD MOST a/b/c) GAMBA		7x 6x 1x no answer	A B C ALL not answered other answer	5x 2x 6x 1x 1x 1x (M9)	A All the same	4x 5x

P22c (SOLD LEAST) BOQUERON	B C ALL no answer	3x 6x 1x 4x	A B C NONE not answered other answer	5x 0x 4x 6x M9 Boqueron: Ja- Feb, Jan Feb, nothing. Sardina Jan-Feb, Jan - Feb, nothing, Gamba Jan-Feb, Jan-Feb	C All the same	4x 5x
P22c (SOLD LEAST) SARDINA	B C ALL no answer	3x 6x 1x 4x	A B C NONE not answered other answer	6x 0x 3x 1x 5x M9 Boqueron: may to august - May to august - nothing, Sardina May to August, May to august, nothing, Gamba december, december, nothing	C All the same	4x 5x
P22c (SOLD LEAST) GAMBA	B C ALL no answer	3x 6x 1x 4x	A B C NONE not answered other answer	6x 0x 5x 1x 3x M9 Boqueron: may to august - May to august - nothing, Sardina May to August, May to august, nothing, Gamba december, december, nothing	C All the same	4x 5x
P22d (22cEXPLAIN)						

P23a (QUALITY (1/2/3/N) BOQUERON	3 2 1 none	1x 1x 1x 8x	A B C None/Ninguna not answered	1x 0x 0x 12x 4x	3 2 1 none	9x
P23a (QUALITY (1/2/3/N) SARDINA	3 2 1 none	1x 2x 1x 8x	A B C None/Ninguna not answered	1x 0x 0x 12x 4x	3 2 1 none	9x
P23a (QUALITY (1/2/3/N) GAMBA	3 2 1 none	1x 1x 1x 8x	A B C None/Ninguna not answered	2x 0x 0x 12x 4x	3 2 1 none	9x

C) Summary responses survey Torremolinos

Category	Restaurants/Cafés Torremolinos	% out of total T	Marketpeople Torremolinos	% out of total T	Fishers Torremolinos	% out of total T
P1 (=GENDER m/f)	male/female	3/16 female 13/16 male	male/female	1/14 female 13/14 male	male/female	12/12 = 100% male
P2 (=AGE)		not sufficient inputs	42, 36, 37	not sufficient inputs		
P3 (=PROFESSION)	Waiter/Waitress Manager/ Owner	6x 10x	Fishmonger Fish retailer Owner Waiter* (*sell and serve at small bars at/close to the market)	2x 4x 4x 4x	Fisher	12
P4 (=MAIN FUNCTION)	customer service cleaning + service management	6x 2x 6x	Management Sales (selling, buying) Service Business Cleaning fish Marketing	6x 10x 2x 2x 2x 1x	Fishing/Catching Selling	10x, but most likely 12 in reality 6x
P5 (SECTORS)	Fishermen; Businessmen; Distributors, Marketpeople, Clients/Customers Hotels Other restaurants	7x 6x 8x 5x 9x 1x 1x	Fishermen; Businessmen; Distributors, Marketpeople, Clients/Customers Hotels Restaurants	8x 5x 9x 9x 8x 1x 3x	Fishermen; Distributors, Marketpeople, Clients/Customers Hotels Small shops	1x 7x 11x 2x 2x 4x

P5a (MEANS OF CONTACT)	Personal Telephone T+P ALL	5x 0x 4x 7x	Personal Telephone T+P ALL T+P+E	4x 0x 6x 3x 1x	Personal Telephone T+P ALL T+P+E T+P+Whatsapp	5x 0x 2x 1x 3x 1x
P5b (MOTIVE)	Buying and Selling Business Customer Service Marketing	9x 1x 5x 1x	Buying and/or Selling Business Management Customer Service Marketing	11x 0x 2x 1x 0x	Buying and Selling Business	10x 2x
P6 (MOST CONTACT)	Fishers Distributors Marketpeople Others ; Customers Others: Business	3x 9x 6x 6x 2x	Fishers Distributors Marketpeople Restaurants/Cafés Others	7x 13x 3x 14x 1x	Fishers Distributors Marketpeople Restaurants/Cafés Others: Hotel	0x 8x 12x 11x 1x
P7 (TIMES A MONTH)	Daily 20 20-25 20-30	12x 2x 1x 1x	Daily Daily and weekly Often A lot	6x 3x 2x 1x	Daily/ Every weekday	12x
P8 (=CONTACT FISHERS D/W/M)	Daily Weekly Monthly Never	10x 4x 1x 1x	Daily Weekly Monthly Never	1x 8x 0x 5x	Daily Weekly Monthly Never	2x 0x 0x 10x
P8 (=CONTACT DISTRIBUTORS D/W/M)	Daily Weekly Monthly Never	9x 6x 0x 1x	Daily Weekly Monthly Never	13x 0x 0x 1x	Daily Weekly Monthly 20x 24x Never	6x 0x 0x 1x 1x 4x
P8 (=CONTACT MARKETPEOPLE D/W/M)	Daily Weekly Monthly Never	4x 11x 1x 0x	Daily Weekly Monthly Never	11x 3x 0x 0x	Daily Weekly Monthly 20x 24x Never	9x 0x 0x 1x 2x 0x
P8 (=CONTACT RESTAURANTS D/W/M)	Daily Weekly Monthly Never	4x 4x 6x 2x	Daily Weekly Monthly Never	8x 5x 0x 1x	Daily Weekly Monthly 20x 24x Never	8x 0x 0x 1x 2x 1x
P8 (=CONTACT OTHERS D/W/M)						
P9 (=OTHER GROUPS Y/N)	No Yes	12x 4x	No Yes	12x 2x	No Yes	10 2
P9b (WHICH OTHERS)	Hoteliers/Hotel chains	4x	Hoteliers/Hotel chains	2x	Hoteliers/Hotel chains Shops (*that sell fish, like fish/meat	2x

					shops)	
P10 (X A MONTH OTHER GROUP)	4-8 8-10 no answer	1x 1x 2x	4-8 4	1x 1x	Daily 24	1x 1x
P11a (IMPACT COMPANY 2014-2017)	10 9 8 7 5	13x 3x 0x 0x 0x	10 9 8 7 6 5	5x 2x 1x 0x 2x 4x	10 9 8 7 6 5	1x 0x 3x 3x 3x 2x
P11b (11aEXPLAIN)						
P12a (IMPACT COMPANY 2007-2014)	10 9 8 7 5	12x 2x 1x 1x 0x	10 9 8 7 6 5	5x 2x 1x 0x 2x 4x	10 9 8 7 6 5	1x 0x 2x 4x 3x 2x
P12b (12aEXPLAIN)						
P13a (IMPACT COMPANY 1992-2007)	10 9 8 7 no answer	12x 2x 1x 0x 1x	10 9 8 7 6 5 no answer	3x 2x 1x 0x 2x 3x 3x	10 9 8 7 6 5	1x 0x 0x 3x 6x 2x
P13b (13aEXPLAIN)						
P14a (IMPACT CONTACT 2014-2017)	10 9 8 7 6 5	0x 1x 2x 2x 4x 7x	10 9 8 7 6 5	0x 0x 0x 2x 0x 12x	10 9 8 7 6 5	0x 0x 0x 1x 2x 9x
P14b (14aEXPLAIN)						
P15a (IMPACT CONTACT 2007-2014)	10 9 8 7 6 5	0x 0x 1x 3x 5x 7x	10 9 8 7 6 5	0x 0x 0x 2x 0x 12x	10 9 8 7 6 5	0x 0x 0x 1x 2x 9x
P15b (15aEXPLAIN)						
P16a (IMPACT CONTACT 1992-2007)	10 9 8 7 6 5 no answer	0x 0x 2x 1x 5x 7x 1x	10 9 8 7 6 5 no answer	0x 0x 0x 1x 0x 10x 3x	10 9 8 7 6 5 no answer	0x 0x 0x 1x 2x 9x
P16b (16a EXPLAIN)						

P17a (FISH STOCK 1-5 B/S/G 2014-2017) BOQUERON	5 4 3 2	2x 3x 11x 0x	5 4 3 2	0x 0x 13x 1x	5 4 3 2	0x 0x 7x 5x
P17a (FISH STOCK 1-5 B/S/G 2014-2017) SARDINA	5 4 3 2	2x 3x 11x 0x	5 4 3 2	0x 0x 13x 1x	5 4 3 2	0x 0x 7x 5x
P17a (FISH STOCK 1-5 B/S/G 2014-2017) GAMBA	5 4 3 2	2x 3x 11x 0x	5 4 3 2	0x 0x 11x 3x	5 4 3 2	0x 0x 8x 4x
P18a (FISH STOCK 1-5 B/S/G 2007-2014) BOQUERON	5 4 3 2	2x 1x 13x 0x	5 4 3 2	0x 0x 13x 1x	5 4 3 2	0x 0x 7x 5x
P18a (FISH STOCK 1-5 B/S/G 2007-2014) SARDINA	5 4 3 2	2x 1x 13x 0x	5 4 3 2	0x 0x 13x 1x	5 4 3 2	0x 0x 7x 5x
P18a (FISH STOCK 1-5 B/S/G 2007-2014) GAMBA	5 4 3 2	2x 1x 13x 0x	5 4 3 2	0x 0x 11x 3x	5 4 3 2	0x 0x 8x 4x
P19a (FISH STOCK 1-5 B/S/G 1992-2007) BOQUERON	5 4 3 2 not applicable	2x 1x 12x 0x 1x	5 4 3 2 not applicable	0x 0x 10x 1x 3x	5 4 3 2 not applicable	0x 0x 7x 5x
P19a (FISH STOCK 1-5 B/S/G 1992-2007) SARDINA	5 4 3 2	2x 1x 12x 0x 1x	5 4 3 2 not applicable	0x 0x 10x 1x 3x	5 4 3 2	0x 0x 7x 5x
P19a (FISH STOCK 1-5 B/S/G 1992-2007) GAMBA	5 4 3 2	2x 1x 12x 0x 1x	5 4 3 2 not applicable	0x 0x 9x 2x 3x	5 4 3 2	0x 0x 8x 4x
P22a (SOLD MOST a/b/c) BOQUERON	A Always the same	8x 8x	A Always the same	8x 6x	A Always the same	6x 6x
P22a (SOLD MOST a/b/c) SARDINA	A Always the same	8x 8x	A Always the same	8x 6x	A Always the same	6x 6x
P22a (SOLD MOST a/b/c) GAMBA	A Always the same	8x 8x	A Always the same	8x 6x	A Always the same	6x 6x
P22c (SOLD LEAST) BOQUERON	B C ALL	4x 4x 8x	B C ALL	4x 5x 5x	B C ALL	3x 3x 6x

P22c (SOLD LEAST) SARDINA	B C ALL	4x 4x 8x	B C ALL	4x 5x 5x	B C ALL	3x 3x 6x
P22c (SOLD LEAST) GAMBA	B C ALL	4x 4x 8x	B C ALL	4x 5x 5x	B C ALL	3x 3x 6x
P23a (QUALITY (1/2/3/N) BOQUERON	3 2 1 none	0x 0x 0x 16x	3 2 1 none	0x 0x 0x 14x	3 2 1 none	0x 0x 0x none
P23a (QUALITY (1/2/3/N) SARDINA	3 2 1 none	0x 0x 0x 16x	3 2 1 none	0x 0x 0x 14x	3 2 1 none	0x 0x 0x none
P23a (QUALITY (1/2/3/N) GAMBA	3 2 1 none	0x 0x 0x 16x	3 2 1 none	0x 0x 0x 14x	3 2 1 none	0x 0x 0x none

D) Binary codes ‘Sectors’ and ‘Most Contact’ Málaga

ID	business	distributors	market	restaurants	fishers	customers	greengrocers	food and drinks c	computing	butchers	lawyers	banks	hotels	shops
MM1	0	0	0	0	1	1	0	0	0	0	0	0	1	0
MM2	0	1	0	0	0	0	0	0	0	0	0	0	0	0
MM3	1	1	0	0	0	1	0	0	0	0	0	0	0	0
MM4	0	1	0	1	1	1	0	0	0	0	0	0	0	0
MM5	0	1	1	1	0	1	0	0	0	0	0	0	0	0
MM6	0	1	0	0	0	1	0	0	0	0	0	0	0	0
MM7	1	1	0	0	1	1	0	0	0	0	0	0	0	0
MM8	1	1	0	0	0	1	0	0	0	0	0	0	1	0
MM9	0	1	0	0	1	0	0	0	0	0	0	0	0	0
MM10	1	1	1	1	1	1	0	0	0	0	0	0	0	0
MM11	0	1	1	0	0	0	0	0	0	0	0	0	0	0
MM12	0	0	0	1	0	0	0	0	0	0	0	0	0	0
MM13	0	1	0	0	0	0	0	0	0	0	0	0	0	0
MM14	0	1	0	1	0	0	0	0	0	0	0	0	0	0
MM15	1	1	0	1	0	0	0	0	0	0	0	0	0	0
MM16	1	1	0	1	0	0	0	0	0	0	0	0	0	0
MM17	0	1	0	0	1	0	0	0	0	0	0	0	0	0
MRC1	1	1	0	0	1	0	1	0	0	0	0	0	0	0
MRC2	0	0	0	0	1	0	0	1	1	1	0	0	0	0
MRC3	1	0	0	0	1	0	1	0	0	1	0	0	0	0
MRC4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MRC5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MRC6	1	1	0	0	1	0	0	0	0	0	0	0	0	0
MRC7	0	1	0	0	0	1	0	0	0	0	0	0	0	0
MRC8	1	1	0	0	0	0	0	0	0	0	0	1	0	0
MRC9	0	0	0	0	0	1	0	0	0	0	0	0	0	0
MRC10	0	0	0	0	0	1	0	0	0	0	0	0	0	0
MRC11	0	1	1	0	1	1	0	0	0	0	0	0	0	0
MRC12	0	1	1	1	1	1	0	0	0	0	0	0	0	0
MRC13	0	0	0	0	0	1	0	0	0	0	0	0	0	0
MRC14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
MF2	0	1	0	1	1	0	0	0	0	0	0	0	0	0
MF3	0	1	0	1	0	0	0	0	0	0	0	0	0	0
MF4	0	1	0	1	0	0	0	0	0	0	0	0	0	0
MF5	0	1	0	0	1	0	0	0	0	0	0	0	0	0
MF6	0	1	0	1	1	0	0	0	0	0	0	0	0	0
MF7	0	1	0	0	0	0	0	0	0	0	0	0	0	0
MF8	0	1	0	1	0	0	0	0	0	0	0	0	0	0
MF9	0	1	0	0	0	0	0	0	0	0	0	0	0	0

	business	distributors	market	restaurants	fishers	customers	others
MM1	0	1	0	1	1	0	0
MM2	0	1	0	1	0	0	0
MM3	0	1	0	1	0	0	0
MM4	0	1	0	0	0	0	0
MM5	0	0	0	1	0	1	0
MM6	0	1	0	1	0	0	0
MM7	0	1	0	0	0	0	1
MM8	0	0	1	1	0	0	1
MM9	0	1	0	0	0	0	0
MM10	0	0	1	1	0	0	1
MM11	0	1	1	0	0	0	0
MM12	0	0	0	1	0	0	0
MM13	0	1	0	0	0	0	0
MM14	0	1	0	1	0	0	0
MM15	1	1	0	1	0	0	0
MM16	0	1	0	0	1	0	0
MM17	0	1	0	0	0	1	0
MRC1	0	1	1	1	1	0	0
MRC2	0	0	0	1	0	0	0
MRC3	0	1	0	1	0	0	1
MRC4	0	0	0	1	0	0	1
MRC5	0	1	0	1	1	0	0
MRC6	0	0	1	1	0	0	1
MRC7	0	0	1	1	0	0	0
MRC8	0	1	1	1	0	0	0
MRC9	0	0	0	1	0	1	0
MRC10	0	0	0	1	0	1	0
MRC11	0	1	1	1	1	0	0
MRC12	0	1	1	1	1	0	0
MRC13	0	0	1	1	0	1	0
MRC14	0	1	0	0	0	1	0
MF1	0	1	0	0	0	0	0
MF2	0	1	0	0	0	0	0
MF3	0	1	0	1	0	0	0
MF4	0	1	1	0	1	0	0
MF5	0	1	1	0	1	0	0
MF6	0	1	1	1	1	0	0
MF7	0	1	0	0	1	0	0
MF8	0	1	1	1	1	0	0
MF9	0	1	0	0	1	0	0

E) Binary codes ‘Sectors’ and ‘Most Contact’ Torremolinos

ID	business	distributors	market	restaurants	fishers	customers	greengrocers	food and drinks c	computing	butchers	lawyers	banks	hotels	shops
TM1	1	0	1	0	1	1	0	0	0	0	0	0	0	0
TM2	0	0	1	0	0	1	0	0	0	0	0	0	0	0
TM3	1	1	1	0	1	0	0	0	0	0	0	0	0	0
TM4	1	1	1	0	1	0	0	0	0	0	0	0	1	0
TM5	1	1	1	0	1	0	0	0	0	0	0	0	0	0
TM6	0	1	1	0	1	1	0	0	0	0	0	0	0	0
TM7	0	0	1	0	0	1	0	0	0	0	0	0	0	0
TM8	1	1	1	0	1	0	0	0	0	0	0	0	0	0
TM9	0	1	0	0	0	0	0	0	0	0	0	0	0	0
TM10	0	1	1	0	0	1	0	0	0	0	0	0	0	0
TM11	0	1	0	1	1	1	0	0	0	0	0	0	0	0
TM12	0	0	0	1	1	1	0	0	0	0	0	0	0	0
TM13	0	1	0	1	0	1	0	0	0	0	0	0	0	0
TM14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRC1	1	0	0	0	1	0	0	0	0	0	0	0	1	0
TRC2	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRC3	0	1	1	0	1	1	0	0	0	0	0	0	0	0
TRC4	1	1	0	0	1	0	0	0	0	0	0	0	1	0
TRC5	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRC6	1	1	1	0	1	0	0	0	0	0	0	0	0	0
TRC7	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRC8	0	1	0	1	1	0	0	0	0	0	0	0	0	0
TRC9	0	1	0	0	1	0	0	0	0	0	0	0	0	0
TRC10	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRC11	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRC12	1	1	1	0	0	0	0	0	0	0	0	0	0	0
TRC13	0	1	1	0	1	0	0	0	0	0	0	0	0	0
TRC14	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TRC15	1	0	0	0	0	1	0	0	0	0	0	0	0	0
TRC16	1	1	0	0	0	1	0	0	0	0	0	0	0	0
TF1	0	1	1	1	0	0	0	0	0	0	0	0	0	0
TF2	0	1	1	1	0	0	0	0	0	0	0	0	0	1
TF3	0	0	1	1	0	0	0	0	0	0	0	0	0	1
TF4	0	0	1	1	0	0	0	0	0	0	0	0	0	1
TF5	0	1	1	1	0	0	0	0	0	0	0	0	0	0
TF6	0	1	1	1	0	1	0	0	0	0	0	0	0	0
TF7	1	0	0	1	0	0	0	0	0	0	0	0	0	0
TF8	0	1	1	0	1	0	0	0	0	0	0	0	0	0
TF9	0	0	1	1	0	0	0	0	0	0	0	0	1	0
TF10	0	1	1	0	0	0	0	0	0	0	0	0	0	0
TF11	0	0	1	1	0	0	0	0	0	0	0	0	0	1
TF12	0	1	1	1	0	0	0	0	0	0	0	0	1	0

	business	distributors	market	restaurants	fishers	customers	others
TM1	0	1	1	1	1	0	0
TM2	0	1	0	1	1	0	0
TM3	0	1	1	1	0	0	0
TM4	0	1	1	1	0	0	0
TM5	0	1	0	1	1	0	0
TM6	0	1	0	1	1	0	0
TM7	0	1	0	1	0	0	0
TM8	0	0	0	1	1	0	0
TM9	0	1	1	1	0	0	0
TM10	0	1	0	1	1	0	0
TM11	0	0	1	1	0	0	0
TM12	0	1	0	1	1	0	0
TM13	0	1	0	1	0	0	1
TM14	0	1	0	1	0	0	0
TRC1	0	1	0	0	0	0	1
TRC2	0	0	0	0	0	1	1
TRC3	0	1	1	0	0	0	0
TRC4	0	1	0	0	0	0	0
TRC5	0	0	0	0	0	1	0
TRC6	0	1	1	0	1	0	0
TRC7	0	0	0	0	0	1	0
TRC8	0	1	1	0	1	0	0
TRC9	0	1	0	0	0	1	0
TRC10	0	0	1	0	0	1	0
TRC11	0	0	0	0	0	1	0
TRC12	0	1	0	0	1	0	0
TRC13	0	1	1	0	0	0	0
TRC14	0	0	0	0	0	1	0
TRC15	0	1	1	0	0	0	0
TRC16	1	1	0	0	0	0	0
TF1	0	1	1	1	0	0	0
TF2	0	0	1	1	0	0	0
TF3	0	0	1	1	0	0	0
TF4	0	0	1	1	0	0	0
TF5	0	1	1	1	0	0	0
TF6	0	1	1	1	0	0	0
TF7	0	1	1	1	0	0	0
TF8	0	1	1	1	1	0	0
TF9	0	1	1	1	0	0	1
TF10	0	1	1	0	0	0	0
TF11	0	1	1	0	0	0	1
TF12	0	1	1	1	0	0	0

F) Raw data for tourism in Andalusia 2000-2016

	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	Average 2000-2015
Jan	445.806	371.524	331.962	267.637	291.480	333.755	349.015	314.529	383.570	412.785	387.885	417.419	383.070	386.360	344.018	305.077	288.855	353.809
Feb	490.618	415.576	371.988	335.244	333.853	367.451	373.152	357.134	421.022	445.740	419.723	443.495	451.791	424.822	412.134	351.367	356.390	398.324
Mar	688.857	547.353	464.633	517.456	474.535	525.336	522.365	475.920	621.980	613.671	542.502	579.603	508.632	550.726	592.777	484.284	500.965	541.859
Apr	998.659	831.238	855.343	711.044	722.235	751.179	596.346	684.367	687.365	729.432	722.480	651.930	694.063	686.473	631.991	718.589	780.529	732.545
May	1.048.532	941.571	858.041	780.668	735.642	761.618	789.874	741.492	794.650	816.345	775.724	782.859	753.207	784.370	694.820	648.329	609.661	783.377
Jun	1.065.963	915.577	856.167	817.221	799.751	838.196	730.240	731.542	793.652	788.404	751.912	784.691	728.975	759.847	719.916	715.739	661.327	791.713
Jul	1.218.079	1.100.202	1.055.561	999.912	933.902	989.511	933.188	908.764	984.732	1.071.029	988.716	1.035.156	952.898	931.162	893.148	966.463	837.916	988.255
Aug	1.359.694	1.262.211	1.186.226	1.094.291	1.084.185	989.517	1.037.031	1.093.345	1.093.836	1.050.256	945.854	1.161.737	1.110.680	1.126.494	1.084.336	1.156.139	860.101	1.099.761
Sep	1.112.914	1.012.488	959.113	887.145	858.024	828.620	736.380	699.314	813.063	903.376	851.413	898.057	865.661	808.719	808.710	804.752	749.738	858.676
Oct	1.094.371	996.515	822.829	741.774	698.753	754.493	677.798	676.768	705.870	759.332	718.452	714.349	720.657	705.303	705.740	655.998	615.732	750.867
Nov	551.725	485.964	389.625	378.456	363.616	346.690	384.892	378.090	351.142	427.806	434.859	440.069	395.683	374.877	396.485	389.464	380.125	404.092
Dec	495.680	485.014	350.502	340.262	281.675	314.500	310.590	404.151	324.319	411.379	436.108	442.262	401.854	379.581	402.092	395.311	350.634	383.877
Total	10.570.898	9.365.233	8.501.990	7.871.110	7.577.651	7.800.866	7.440.871	7.465.416	7.975.201	8.429.555	7.975.628	8.351.627	7.967.171	7.918.734	7.686.167	7.591.512	6.991.973	8.087.153