THE CONSEQUENCES OF THE PRESTIGE OIL DISASTER FOR THE GALICIAN SHELLFISHERWOMEN AND THEIR ROLE IN THE REGENERATION OF THE SHELLFISHING ZONES

Amanda Braga do Melo Fadigas

Universitat de Girona

DOCTORAL THESIS

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CERTIFIQUEN:

Que aquest treball, titulat "**The consequences of the Prestige oil disaster for the Galician shellfisherwomen and their role in the regeneration of the shellfishing zones**", que presenta Amanda Braga de Melo Fadigas per a l'obtenció del títol de doctora, ha estat realitzada sota la seva direcció i que compleix els requisits per poder optar al títol de doctora.

I perquè així consti, siguen aquest certificat el 08 de setembre de 2017,

Dra. Josepa Bru Bistuer
Professora catedrática
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"Há mulheres que trazem o mar nos olhos
Não pela cor
Mas pela vastidão da alma
E trazem a poesia nos dedos e nos sorrisos
Ficam para além do tempo
Como se a maré nunca as levasse
Da praia onde foram felices"

Sophia de Mello Breyner Andresen

(1919-2004, Portuguese poetess)

"The most valuable thing we extract
from the ocean is our existence"

Sylvia E. Earle

(1935, American oceanographer, explorer, author and lecturer)

List of acronyms

CEC (Council of the European Commission)

CEDAT (Center for Environmental Law in Tarragona)

CEDRE (Centre of Documentation Research and Experimental on Accidental Water)

EC (European Commission)

EEA (European Environment Agency)

EIGE (European Institute for Gender Equality)

EOI (Escuela de Organización Industrial)

GIA (Gender Impact Assessment)

IGE (Galician Statistical Institute)

IA (International Alert)

MAGRAMA (Ministry of Environment, Agriculture, Fisheries and Food)

NAPE (National Association of Professional Environmentalists)

NGOs (Non-Governmental Organizations)

PAR (Pressure And Release)

SIA (Social Impact Assessment)

UdG (University of Girona)

URV (Rovira i Virgilli University)

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Resum

La zona costera representa un important medi de vida per a les dones involucrades amb les activitats pesqueres. No obstant això, cada cop són més freqüents els desastres petrolers que pressionen l'ambient marí. Aquest fet posa en evidència el risc sòcio-ambiental a què s'enfronten aquests grups de dones amb una alta dependència del medi marí. En aquest context, aquesta tesi doctoral presenta un apropament entre el desastre provocat pel vaixell petroler a la zona costera de Galicia, a Espanya, l'any 2002, i les mariscadores gallegues. L'objectiu d'aquest estudi és analitzar el desastre del Prestige des d'una perspectiva de gènere, tot identificant els elements que han afectat les mariscadores gallegues, així com el seu rol en la recuperació de les zones de marisqueig.

En aquesta investigació, feta entre gener de 2013 i abril de 2017, es va utilitzar la metodologia qualitativa a partir de l'ús de dades primàries i secundàries. Les dades primàries van ser col·lectades a través de la realització d'entrevistes en profunditat, semi-estructurades, a tres grups de participants: mariscadores gallegues, agents no-governamentals i investigadors. Les dades secundàries van ser extretes de bases de dades d'instituts estadístics, de pesca i de medi ambient. Les dades van ser processades d'acord amb el procés de codificació, i van ser interpretades en base a les categories analítiques de vulnerabilitat, impacte i resiliència.

Els resultats mostren que en el període previ a l'accident del Prestige les mariscadores ocupaven una posició marginal dins del sector pesquer. A més, aquest grup de dones tenien una forta dependència d'una zona costera ja debilitada per la pol·lució i la falta de mesures de protecció ambiental. La combinació d'aquests factors van deixar les mariscadores en una condició d'alta vulnerabilitat davant de la imminència d'una marea negra.

Així, després de l'accident del Prestige, la falta de preparació a desastres, les característiques pròpies del vessament i el menyspreu al coneixement local de la comunitat pesquera van ser errors que van augmentar l'exposició al petroli de les zones de marisqueig. Com a conseqüències, les mariscadores van tenir diverses dimensions de sensibilitat impactades. A curt i mig termini els principals impactes identificats van ser el danys immaterials i la desproporció en el tractament i l'assistència dispensats a les zones de marisqueig afectades. D'altra banda, els impactes a llarg termini detectats van ser els canvis en la disponibilitat dels recursos marins, la interferència d'altres fonts de pol·lució marina que augmenten la pressió

sobre la zona, i la presència de condicions desfavorables per a l'establiment d'una cultura de risc.

Des del moment de l'accident, al 2002, fins a l'última dècada post-Prestige, els resultats van identificar diverses accions de resiliència desenvolupades per les mariscadores en les distintes etapes de preparació, resposta i recuperació. Aquestes accions van demostrar ser essencials per mantenir la conservació mínima de les zones de marisqueig, tant a curt com a llarg termini. Les mariscadores es van veure motivades a realitzar aquestes accions principalment per les seves característiques socials, econòmiques, ambientals, ètiques i de gènere. Encara que han estat invisibilitzades en el procés de conservació de la costa en el post-Prestige i si es consideren les circumstàncies de l'esdeveniment, les mariscadores van demostrar una alta capacitat de resiliència als canvis provocats per les marees negres.

Es conclou, així, que l'accident del Prestige va representar una forta amenaça al sistema soci-ecològic del marisqueig. L'efecte del desastre sobre el medi marí va provocar canvis significatius en les zones de marisqueig, i va tenir serioses implicacions per a les mariscadores. Atès que les mariscadores van ser les principals responsables de la protecció de les seves zones, i si es té en compte la seva experiència amb el desastre del Prestige, elles haurien d'estar incloses en la gestió costera en vista a contribuir a la reducció de la pol·lució a la costa Gallega.

Resumen

La zona costera representa un importante medio de vida para las mujeres involucradas en las actividades pesqueras. Sin embargo, son cada vez más frecuentes los desastres petroleros que presionan el ambiente marino. Este hecho pone en relieve el riesgo socio-ambiental al que se enfrentan esos grupos de mujeres con una alta dependencia del medio marino. En este contexto, esta tesis de doctorado presenta una aproximación entre el desastre provocado por el buque petrolero Prestige en la zona costera de Galicia, en España, 2002, y las mariscadoras gallegas. El objetivo de este estudio es analizar el desastre del Prestige desde una perspectiva de género, identificando los elementos que han afectado a las mariscadoras gallegas, así como su rol en la recuperación de las zonas de marisqueo.

Para llevar a cabo esta investigación, realizada entre Enero de 2013 y Abril de 2017, se utilizó la metodología cualitativa a partir del uso de datos primarios y secundarios. Los datos primarios fueron colectados a través de la realización de entrevistas en profundidad semi-estructuradas a tres grupos de participantes: mariscadoras gallegas, agentes no-gubernamentales e investigadores. Los datos secundarios fueron extraídos de bases de datos de institutos estadísticos de pesca y de medio ambiente. Los datos fueron procesados de acuerdo con el proceso de codificación y fueron interpretados en base a las categorías analíticas de vulnerabilidad, impacto y resiliencia.

Los resultados muestran que, en el periodo previo al accidente del Prestige, las mariscadoras ocupaban una posición marginal dentro del sector pesquero. Además, ese grupo de mujeres tenía una fuerte dependencia de una zona costera ya fragilizada por la polución y la falta de medidas de protección ambiental. La combinación de esos factores dejó a las mariscadoras en una condición de alta vulnerabilidad ante la inminencia de una marea negra.

Así, una vez ocurrido el accidente del Prestige, la falta de preparación a desastres, las características propias del derrame y el menosprecio hacia el conocimiento local de la comunidad pesquera fueron fallos que aumentaron la exposición al petróleo de las zonas de marisqueo. Como consecuencias, las mariscadoras tuvieron varias dimensiones de sensibilidad impactadas. En el corto y medio plazo, los principales impactos identificados fueron los daños inmateriales y la desproporción en el tratamiento y asistencia dispensados a las zonas marisqueras afectadas. Por otro lado, los impactos a largo plazo detectados fueron los cambios en la disponibilidad de los recursos marinos, la interferencia de otras fuentes de polución marina, aumentando la

presión sobre la zona, y la presencia de condiciones desfavorables al establecimiento de una cultura de riesgo.

Desde el momento del accidente en el 2002 hasta la última década post-Prestige, los resultados identificaron diversas acciones de resiliencia desarrolladas por las mariscadoras en las distintas etapas de preparación, respuesta y recuperación. Estas acciones demostraron ser esenciales para la mantener la conservación mínima de las zonas de marisqueo, tanto a corto como a largo plazo. Las mariscadoras se vieron motivadas a realizar esas acciones principalmente por sus características social, económica, ambiental, ética y de género. Aunque hayan estado invisibilizadas en el proceso de conservación de la costa en el post-Prestige y considerando las circunstancias del evento, las mariscadoras han demostrado una alta capacidad de resiliencia a los cambios provocadas por las mareas negras.

Se concluye, así, que el accidente del Prestige representó una fuerte amenaza para el sistema socio-ecológico del marisqueo. El efecto del desastre sobre el medio marino provocó cambios significativos en las zonas de marisqueo, con serias implicaciones para las mariscadoras. Como las mariscadoras fueron las principales responsables de la protección de sus zonas y considerando su experiencia con el desastre del Prestige, ellas deben ser incluidas en la gestión costera en vista contribuir la reducción de la polución en la costa Gallega.

Abstract

The coastal zone constitutes an important livelihood for women engaged in fishing activities. However, oil disasters that press the marine environment are becoming more frequent. This fact highlights the socio-environmental risks faced by groups of women with a high dependence on the marine environment. In this context, this doctoral thesis examines the catastrophe provoked by the oil tanker Prestige in the Galician coastal zone of Spain in 2002, and the Galician shellfisherwomen affected by it. The objective of the study is to analyse the Prestige disaster through a gender perspective, identifying the elements that have affected Galician shellfisherwomen, as well as their role in the recovery of the shellfishing zones.

To achieve this research conducted between January 2013 and April 2017, a qualitative methodology was applied, including the collection and analysis of primary and secondary data. Primary data were collected through in-depth interviews with three participating groups: Galician shellfisherwomen, non-governmental agents and researchers. Secondary data were collected from statistical databases, fishing and environmental institutes. The data were coded and interpreted based on the analytical categories of vulnerability, impact and resilience.

The results show that in the period prior to the Prestige disaster, shellfisherwomen were marginal in the fishing sector. In addition, this group of women was strongly dependent on the coastal zone that was already frailty by pollution and lack of environmental protection measures. The combination of these factors led the shellfisherwomen to a condition of high vulnerability to the impending black tide.

Thus, once the Prestige disaster occurred, the lack of disaster preparedness, the characteristics of the spill and the disregard for the local knowledge of the fishing community increased the exposure of shellfishing zones to oil. As a result, shellfisherwomen had several dimensions of sensitivity. In the short- and middle terms, the main impacts were the immaterial damages and the disproportion in the treatment and assistance provided to the affected shellfishing zones. At the same time, the long-term impacts detected were the changes in the availability of marine resources, the interference of other sources of pollution that increase the pressure on the area and the presence of unfavourable conditions for the establishment of a culture of risk.

From the accident in 2002 to the last decade of post-Prestige, the results identified several resilience actions undertaken by shellfisherwomen in the different stages of

preparedness, response and recovery. These actions proved to be essential to ensure a minimum level of conservation of shellfishing zones, both in the short- and in the long-term. The shellfisherwomen were motivated to carry out these actions mainly due to their social, economic, environmental, ethical and gender characteristics. Although they have been invisible in the process of conservancy of the coast in the post-Prestige period, and taking into account the circumstances of the event, shellfisherwomen showed a high level of resilience in the face of the black tides.

In conclusion, the Prestige disaster posed a serious threat to the socio-environmental system of shellfishing. The effects of the accident on the marine environment led to significant changes in shellfishing zones, with serious implications for shellfisherwomen. Given that shellfisherwomen were primarily responsible for protecting their zones, and given their experience with the Prestige catastrophe, they should be included in coastal management to contribute to the reduction of pollution and preparedness to future disasters on the Galician coast.

1. Introduction

Figure 1: *Percebeiras* going to a shellfishing zone

This investigation presents an approaching between the Galician shellfisherwomen and the Prestige oil disaster that occurred in the coastal area of Galicia in 2002. Galicia is an Autonomous Community that represents one of the main fishing areas of Spain. In this area, shellfisherwomen stand out for maintaining the tradition of artisanal fishing in a sustainable way. The significant presence of women in this group, and their persistence in preserving this activity strictly linked to the environment caused my interest in this group.

On the other hand, the high exposure of the Galician coast to the oil disasters indicated a great socio-environmental risk for the activities carried out in this area, especially artisanal fishing. The last major accident with a cargo ship on the Galician coast was the Prestige oil spill in 2002. Drew my attention that although this oil disaster was emblematic, there was no type of study analyzing its consequences for Galician shellfisherwomen.

In addition to this, the long term since this accident brought a unique opportunity to study this event from a temporal overview. The analysis of the pre- and post-disaster period made it possible to assess the Prestige +15, observing the evolution of shellfisherwomen and the conservancy of shellfishing zones. So this moment becomes the most appropriate to communicate the results of that research.

Moreover, as a researcher I had the opportunity to investigate the trajectory of a group of Brazilian shellfisherwomen in the struggle against the pressures on the coastal zone. I could observe that they were the main ones affected by sources of pollution due to socioeconomic and gender factors. At the same time, however, they demonstrated to be an essential stakeholder in the face of threats to their socio-ecological system through the establishment of a protected area. This previous experience in Brazil was the origin of my interest in Galician shellfisherwomen and pressure processes on the Galician coast, which led me to study the Prestige disaster through a gender perspective.

1.1 Research questions

Due to the lack of data on the consequences of the Prestige disaster for Galician shellfisherwomen, this study sought to answer how the environmental degradation caused by the Prestige spill had affected them, and whether they could be considered a relevant stakeholder in the fight against pollution in coastal zone. From these main research questions, many others emerged shaping the study.

First, there was a need to know the scenario prior to the Prestige disaster:

- What was the state of conservation of the zone?
- What were the main challenges faced by shellfisherwomen to develop

shellfishing?

Obtaining these answers would be relevant to understand the true condition of vulnerability of shellfisherwomen in the face of the Prestige disaster, in addition to providing a comparative point to analyze where there were progress and in which remain vulnerable.

The second group of questions was related to the direct effect of the Prestige spill on the Galician shellfisherwomen:

- Given the peculiarities of the shellfishing and the Prestige black tides, what were the short-, medium- and long-term impacts?
- To what extent has the disaster changed dynamics of shellfishing?

The answers to these questions would demonstrate if the Prestige brought specific consequences to this women's group.

Finally, once the scenario generated by the post-Prestige was known, it was worth asking if the shellfisherwomen played any role in disaster management:

- What were the measures taken by them in preparedness, response and recovery?
- Would shellfisherwomen important stakeholders in coastal protection?
- Would they help reduce coastal pollution?
- What limitations could they find to preserve the shellfishing zones?

From these answers it would be possible to indicate a direction towards a more balance marine environment through the participation of the shellfisherwomen.

1.2 Research justification

The effects of the Prestige oil disaster on the marine environment are reflected in the social, cultural, economical and political context of Galician shellfisherwomen. The vulnerability of shellfishing puts at socio-environmental risk a peculiar resource management system engendered by women's groups, which could be strategic to reduce marine pollution on the Galicia coast.

The legal framework, public policies and the implementation of contingency plans for polluting sources should focus on minimizing the impacts generated in the coastal zone, thus allowing the proper development of activities related to the marine environment, especially those that are in a state more vulnerable, such as shellfishing. In this sense this thesis contributes to improving the existing mechanisms for the control of marine pollution, and to inspire the creation of new mechanisms that can

directly benefit the shellfisherwomen and indirectly other fishing categories, as well as the entire chain of productivity that depends on marine resources.

In addition, through the analysis of the Galician experience, it is possible expand the knowledge of disasters and gender, specifically in the context of the oil spill and fisherwomen. Thus, this study allows generating new guidelines to prevent and recover affected areas, besides contributing to the empowerment of women in fishery under the pressure of coastal pollution.

Apart from the theoretical-scientific contribution in a global scenario, the PhD Candidate was funded by the Brazilian research program Science without Boarders, with the aim of contributing to the current research scientific agenda. In accordance with the objectives of the Brazilian research program, the present thesis will add knowledge to the sectors of adaptability and sustainability; governance and participation; environmental degradation; environment and development.

Also, highlight the current panorama of oil exploitation and marine transport in the Brazilian coastal zone. As a result, small and medium-sized spillages have been recorded in recent years, some of which have directly affected fishing communities, including women in fishery. This topic requires more detailed studies on how to act in favor of these social groups in case of pollution, but especially in the effort to avoid future damages.

Finally, this study contributes to the Territory, Environment and Gender research line, of the Analysis, Territory and Environmental Planning group of the University of Girona, which has developed relevant studies on women protagonism in situations of environmental conflicts (Agüera-Cabo 2010; Agüera-Cabo and Bru-Bistuer 2012; Bru-Bistuer 1996a; Bru-Bistuer 1996b).

1.3 Thesis structure

The thesis was elaborated in 11 chapters, being the chapter 6 composed by 3 subchapters with the main results of this investigation.

The **Chapter 1** introduces an overview of the study. The research questions that lead to this thesis are highlighted, as well as the reasons that justify the research. The **Chapter 2** outlines the objectives of the thesis. First, the main objective is presented, followed by three specific objectives. Each specific objective gave rise to the 3 subchapters of the Chapter 6 of Results. **Chapter 3** specifies the particular context of the thesis case study. It presents the characteristics of the Galician shellfisherwomen and a brief history of the oil spill of the Prestige.

The **Chapter 4** presents the fundamentals of research on which this thesis is based. Thus, the connection between women's studies and environmental issues is introduced. Subsequently, the specific context of women in fishery is explained, explaining the characteristics of their participation in this universe and the socio-environmental challenges they face. Afterward, the current status of changes in the coastal zone is examined, giving particular attention to the exposure of women in fishery to hazards, specially oil spill events.

Chapter 5 is divided into four main sections that explain the detailed version of the methodology carried out at all stages. First, the participants of the research are presented and the criteria for selecting them. Next, it is presented in detail how the interview guide was developed as the main instrument used in this research. Subsequently, the procedures are detailed, starting with the bibliographic revision, the revision of legislation, the data collection, the analysis of data and finally the limitations found in the execution of the investigation.

Chapter 6 presents the results of this thesis. It is organized into three main subchapters that were written according to the format of research paper. Thus, **Subchapter 6.1** explores the vulnerability factors of Galician shellfisherwomen in the face of oil spill events, in the period prior to the Prestige disaster. It sought to understand the link between the shellfisherwomen and the coastal zone, and the potential hazard that this socio-ecological system could undergo before the Prestige oil spill. In this way was possible to diagnose the status of shellfisherwomen and the coast, establishing minimum standards to compare the before/after the Prestige disaster.

The **Subchapter 6.2** verifies the impacts of the Prestige oil spill by analyzing the exposure and sensitivities of Galician shellfisherwomen. The first part focused on knowing the features of the accident and how its peculiarities affected the shellfisherwomen. Afterward, the aim was to detect the affected dimensions of the system 'shellfisherwomen-shellfishing zones', in the short, medium ant long term. Therefore, the main changes suffered in the areas studied in the last decades were identified as a consequence of the Prestige disaster.

The **Subchapter 6.3** focuses on explaining the resilient actions of the Galician shellfisherwomen in the face of the Prestige oil disaster. This section analyzed the actions promoted by the shellfisherwomen in the stages of preparedness, response and recovery of the Prestige oil spill. From this study it was observed how they contributed to the restoration of the shellfishing zones and their activities.

The **Chapter 7** deals with the discussion of the thesis, which relates the results of the **Subchapters 6.1**, **6.2** and **6.3** to explain the role of the Galician shellfisherwomen in the Prestige disaster, the state of the shellfishing zones before and after the Prestige spill, and the lessons learned from the experience of the Galician shellfisherwomen. Subsequently, a general conclusion is presented in the **Chapter 8**. Finally, **Chapter 9** proposes some issues that will be addressed in future research.

The references used in the thesis, including those that base the subchapters of the Results, are presented in the **Chapter 10**. The **Chapter 11** provides the interview guides used in the research, the publications produced from this thesis, as well as proof of the revision process of the **Subchapter 6.1**.

Finally, it is relevant consider that, as previously announced, the three subchapters of **Chapter 6** were written in the format of scientific papers, following the criteria of the Journals for which they were submitted. This means that some sections may contain repeated information, such as the case study overview or applied methodology. Moreover, the **Subchapter 6.1** was published in the International Journal of Disaster Risk Reduction, indexed in the Journal Citation Report, Impact Factor 1.242. Doi: https://doi.org/10.1016/j.ijdrr.2017.07.010.

2. Thesis Objective

Figure 2: *Percebeira* looking for *percebe* on rocks at low tide

2.1 Main objective

This thesis aims to analyze the Prestige oil disaster through a gender perspective, identifying the elements that have affected the Galician shellfisherwomen and their role in the recovery of the shellfishing zones.

2.2 Specific objectives

To achieve the main objective, the following specific objectives are proposed:

A. Verify the vulnerability factors that put shellfisherwomen at risk in face of the Prestige disaster (Chapter 4.1).

B. Identify the socio-environmental impacts caused by the Prestige spill in the Galician coastal zone and its implications for shellfisherwomen (Chapter 4.2).

C. Identify the main characteristics of the shellfisherwomen's resilient actions in order to prevent and recover the area affected by the Prestige oil spill (Chapter 4.3).

3. Fundamentals of research

Figure 3: Landscape of a Galician *ría* (estuary) with the bulding of the fish auction on the right

3.1 Approaching women and environmental issues

Rachel Carson's iconic book Silent Spring, in 1962, is considered one of the first environmental manifests that denounced the effects of contamination on the environment. In this work, Carson associates the loss of environmental quality with the use of pesticides. Although at first there was a great resistance to accept the evidences proposed by Carson, this book contributed to broaden the vision on the contamination. Since then, it has begun to problematize other issues related to the degradation of the environment, resulting in the consolidation of environmental awareness in the 1970s (Gochfeld and Goldestein 1999; Littig 2001; Puleo 2011; Resurrección 2013; Scott 2009)

The countries of the North were in an advanced process of industrialization, in addition to the impetus given to nuclear energy. As a consequence, successive accidents resulting from these activities revealed their harmful effects. Air, soil and water pollution from industrial wastes, in some cases toxic wastes, were some of the events that faced the main industrial cities, most expressively in the 1970s, such as Bilbao, Chicago and Tokyo. Moreover, a sequence of hazardous accidents contributed to the perception of risk on the side consequences of high technologies (Bru-Bistuer 1996; Littig 2001; Mies and Shiva 1998; Puleo 2011).

Emblematic accidents revealed the serious effects of contamination and stimulated the emergence of women's movements to mobilize citizenship peacefully and demand a government response. The toxic gas accident in Bophal (India, 1984), or nuclear disasters on Three Mile Island (United States, 1979) and Chernobyl (Soviet Union, 1986) were milestones in the history of environmental degradation (Gochfeld and Goldestein 1999; Littig 2001; Puleo 2011).

On the other hand, also in the decade of 1970 some countries of the South faced other types of environmental threats. The main risk was related to subsistence agriculture and deforestation. In the first case, peasants were at risk of losing food sovereignty, through seed control and intensive pesticide use by multinational corporations. These experiences were widely reported in Latin America and India. But deforestation was also a major problem for rural communities due to the destruction of native forests that would give rise to monoculture of eucalyptus trees for commercial purposes. From this problem emerged in 1977 the emblematic experience of the Chipko movement in India, when rural women reacted peacefully to preserve the forests (Agarwal 1997; Littig 2001; Mies and Shiva 1998; Puleo 2011; Sabaté-Martínez 2000).

From these movements came the need to understand the reasons why women groups have been linked to environmental issues, and why some authors devote their studies to specifically addressing women's groups from a gender perspective.

Scott (1986) is a historian who defined the concept of gender as a social category imposed on a sexual body, contributing to determine specific roles for women and men. These roles vary according to culture, space, historical period, race / caste and class (Agarwal 1992). Even in contemporaneity, and in developed countries, "equality" is only a formality that in theory would give women and men the same conditions in a certain society. But in reality, material inequality persists and often places women in a marginal situation in society. That is why they occupy the first place in the ranking of social and economic inequality, in addition to being the collective with fewer opportunities (Agüera-Cabo and Bru-Bistuer 2012; Bru-Bistuer 1995; de Moraes 2003; Merchant 1996; Sabaté-Martínez, Moya and Muñoz 1995; Sabaté-Martínez 2000).

In rural and fishing communities this gender inequality is usually closely related to environmental issues, since the sexual division of labor also implies the control and management of natural resources. Thus, issues related to ownership of the means of production, decision on resource management, responsibility for a particular type of work, or even the distribution of income among women and men make it more evident why the relation between women and environment can be analyzed from a gender perspective. (Agarwal 2010; Awumbila and Momsen 1995; Britton 2012; Bru-Bistuer 1995; Hapke 2001; Hauzer, Dearden and Murray 2013b; Rocheleau and Edmunds 1997; Sabaté-Martínez 2000).

Furthermore, the some authors indicates that the greater exposure of women's groups to environmental degradation is also a consequence of gender inequality, which is more significant if variables such as social class and race are considered. Some authors point out that women who constitute minority groups (e.g., ethnic minorities or immigrants) are exposed to sources of pollution and other forms of degradation while working (Agarwal 1992; Anugwom and Anugwom 2009; Ikelegbe 2005; Puleo 2011; Pollard 2012; San Sebastián, Amstrong and Stephens 2001; Stott 2010; Zentner and Rondó 2004).

However, there is a lot of effort in the literature to reveal women not only as victims of environmental degradation. Women groups have also been studied as a relevant agent of change, as a stakeholder that assumes the commitment of environmental conservation in both urban and rural contexts. Some elements used by women's groups to contribute to conservancy actions have been identified, such as their specific knowledge of natural resources, the ethical of care, or even the contemporary term ‘sorority", a kind of sisterhood among women who understands the need to work

together in spite of individual differences (Brodsky et al. 2011; Bru-Bistuer 1995; Mulyasari and Shaw 2013; Pincha 2008; Puleo 2011; Resurrección 2013).

Due to the relevance of gender studies and their evident relationship with environmental issues, approximately in the 1990s two main trends were developed to explain what led women to be victims and stakeholders in the environmental context: the essentialist and the constructivist lines.

Essentialist writers have some arguments to justify women's link to the environment. Scholars attribute values to the feminine, as do diversity, harmony, and sustainability. In addition, because of their cyclical nature and other biological characteristics, women and the environment are believed to merge into a kind of symbiosis. It is also noted that women feel a natural identification with elements and phenomena of nature. It is through this spiritual / cultural point of view that this trend explains why women are closer to nature and are more aware of environmental degradation (Agarwal 1992; Littig 2001; Merchant 1996; Mies and Shiva 1998; Puleo 2011).

At the same time, according to this tendency men are linked to culture, so they are guided through the logic of domination and the destruction of nature. This idea of domination is the very one on which patriarchy and capitalism are based, so that women and nature are the main victims of men's actions (Agarwal 1992; Bru-Bistuer 1995; Littig 2001; Merchant 1996; Mies and Shiva 1998; Puleo 2011). Puleo (2011) points out that this dichotomous perspective has its origin in the historical period that originated this tendency, since these ideas were a legacy of the threat of a nuclear war in the 1960s, therefore the focus of the ecofeminists was combat the technological culture that put the environment at risk of destruction.

Two main authors of the essentialist line were Vandana Shiva and María Mies, who through ecofeminism inspired several studies related to environmental issues, mainly in developing countries. Their ideas interpret the environmental conflicts from a geographic perspective, in which there is a clear political and economic domination of the countries of the North towards the countries of the South. Therefore, this vision is currently a strong tool of resistance for women activists in developing countries who are under pressure on their resources by multinational corporations (Jackson 1998; Littig 2001; Martinez 2000; McCusker and Oberhauser 2006; Mies and Shiva 1998; Puleo 2011; Veuthey and Gerber 2010).

In contrast, other scholars have observed that the essentialist line had serious limitations. According to them, women, as an analytical category, should be analyzed considering their heterogeneous characteristics, based on the socioeconomic,

geoenvironmental, cultural and historical differences. In addition, it is important to consider other variables, such as race, class, religion, and even caste, which in some Asian countries is a relevant factor that must be observed (Agarwal 1992, Agarwal 1997; Eisler, Eisler and Yoshida 2003; Littig 2001; Martínez 2000; Puleo 2011).

Constructivist authors began to question about what kind of women we are talking about. According to this trend, the answers to that question go beyond mere biological and symbolic aspects. It is through this more complex view of women's groups that their relationship with the environment is observed (Awumbila and Momsen 1995; Jackson 1998; McCusker and Oberhauser 2006; Veuthey and Gerber 2010).

Some designations derived from the constructivist perspective, such as Val Plumwood's feminism ecological critical in 1991, Carolyn Merchant's materialist ecofeminism in 1992, Dianne Rocheleau's feminist political ecology in 1996, Mary Mellor's feminist political economy in 2006, Patricia Perkins's feminist ecological economics in 2005 (Veuthey and Gerber 2010; Littig 2001; Puleo 2011).

One of the pioneering authors was Bina Agarwal, an economist who launched the term feminist environmentalism in 1992. Agarwal (1992) argued that the link between women and nature is being built according to their material reality, through the specificities in which they interact with the environment. For feminist environmentalism, within a given historical period and cultural context, factors such as gender, class and race (or caste) influence the division of labor and the distribution of power and property. Therefore, these factors condition the place and roles of women in society, which implies in many respects: the type of interaction of women with nature; the type of resources managed by them; the acquired knowledge of the experience with the environment; how changes in the environment can affect them; and finally, how they can respond to changes. This is precisely the theoretical line adopted in this study.

According to Agarwal, in order to change the current model of environmental degradation that has mainly affected women's groups, it is necessary to overcome some challenges. Agarwal (1992) argues that corporations, media groups, faith-based organizations, legal entities and educational groups have the power to decide on economic and natural resources, in addition to cultivating the idea that the status quo is unalterable, which contributes to social apathy. Moreover, since feminism, it defends changes in gender relations between women and men, which must affect the sexual division of labor in favor of a more equitable society.

Finally, the author is convinced that a more sustainable world depends on a real change in the relationship between humanity and nature. This perspective is related to

a transformation of values, but also to the need to democratize access to natural resources. This means that, firstly, women must be recognized as an environmental agent who manages natural resources on a daily basis, mainly in rural and fishing areas. Their invisibility as managers also affects how the government and its environmental policies see them. The empowerment of women is therefore an important way to include women's groups in the decision-making process towards more equitable resource management.

Thus, it is possible observe the application of this approach in different scenarios, such as forest and agrarian (Agarwal 2010; Nation 2010; Rocheleau and Edmunds 1997; Shandra, Shandra and London 2008), water resources (Kevany and Huisingh 2013; Larson, Ibes and White 2010); or fishing (Göncüogly and Ünal 2011; Hauzer, Dearden and Murray 2013b; Immanuel and Rao 2009).

3.2 Women in fishery

The coastal zone is a relevant space for socio-environmental interaction. Throughout the world it is possible to find examples of how fishing activities represent the main livelihood of thousands of people, so it is possible to say that this social group has a high dependence on the marine environmental balance. This is because people who work in fishing often develop a strong sense of identity related to fishing activities, so fishing means more to them than just a job (de Oliveira 2013; Erlandson and Rick 2010).

In this context, where fishing is not seen only as a productive activity, but also as a form of appropriation of natural resources, there are some issues that deserve to be addressed transversally, in terms of gender, resource management and decision-making power.

It is increasingly known in the literature that women have historically been involved in fishing around the world (Dias, Rosa and Damasceno 2007; Fadigas and Garcia 2012; Frangoudes, Marugán-Pintos and Fernández 2008; Göncüoğlu and Ünal 2011; Munk-Madsen 2000; Rocha and Pinkerton 2015; Roots et al. 2014; Weeratunge, Snyder and Sze 2010). They have developed land-based activities, such as net menders manufacturing and marketing or processing fishing, but they can also be found in sea fishing, as well as shellfishing, aquaculture, crab hunting and deep-sea fishing. These activities can be done on two scales, industrial and small-scale fishing.

The first scale, in which there is less presence of women, has the strict objective of negotiating, usually to attend the demands of the international market. In the industrial fishing prevails the use of high technology, commercial fishing boats, and

there is not necessarily a cultural link between the person working in the fishery and his community group. Moreover, this fishing category has been consistently reported as one of the main causes of the depletion of fishing stocks due to the use of aggressive techniques such as trawl fishing (Munizaga, Araya and Rojas 2014; Ovetz 2007).

On the other hand, small-scale fisheries have specific characteristics that favor the greater presence of women. The activities carried out are often based on artisanal methods that have been transmitted over generations, which gives a strong cultural characteristic to this scale of fishing. In addition, these practices have a specific form of appropriation of nature, because the techniques are adapted to the autochthon marine species and the local coastal environment. Furthermore, fishing can be practiced with or without boats or other tools, so it is possible to identify a greater diversity of fishing gear, for example hunting small crustaceans or collecting shellfish. In addition, the literature has reported that the effort for good resource management practices proposed by environmental awareness campaigns is more successful when applied in small-scale fisheries (Beuving 2015; Cissé et al. 2015).

In another aspect, artisanal fishing practices differ according to the socio-economic and cultural context. In developing countries this is an important subsistence activity to ensure family food security (Dias, Rosa and Damasceno 2007; Fadigas and Garcia 2012; Hauzer, Dearden and Murray 2013a; Immanuel and Rao 2009), whereas in developed countries it has been professionalized and affirmed as a relevant productive activity (Frangoudes, Marugán-Pintos and Fernández 2008; Munk-Madsen 2000; Zhao et al. 2013).

The participation of women in fishing activities has made a significant contribution to the local and national economy in different countries. Harper et al. (2013) identified the main condition of women in fisheries and their contributions to this sector on all continents. In this sense, there are drastic differences between regions.

In Europe, the role of women is more prominent in support, processing, trading or other activities in capture fisheries. In African countries there is a wide range of status for women, from participation in fishing at low tide, catching algae or octopus, to intense action on the fishing market. In America, the role of women in fisheries encompasses the transformation of cod into North America, but also into aquaculture, processing, marketing and fishing in the intertidal zones of Central and South America. In Asian countries, women's main participation occurs in the large-scale production of aquaculture. Finally, in Oceania, the largest presence of women is in processing plants (Harper et al. 2013).

The positive impact of the women's work can be seen in actions directly related to fishing, as well as in indirect activities that reflect investments in fishing equipment, fish and shellfish processing, and trading seafood (Frangoudes, Marugán-Pintos and Fernández 2008; Weeratunge, Snyder and Sze 2010).

Another legacy that has been built by women refers to the intangible heritage that keeps the fishing tradition alive. In this sense, Davis and Gerrard (2000) recorded the women's role in the Atlantic North to preserve the communities' fishing identity through social and emotional support, encouraging the peers to persevere in this profession. A similar study was done by Britton (2012) who observed the complex role of women in fishing households as agents of wellbeing in Northern Ireland. Garcia-Negro and Zotes-Tarrio (2006) demonstrate how women from the Galician fishing communities in Spain have been guardian of knowledge about the sea and fishing, transmitting this culture throughout generations.

However, the presence of women in fisheries remains undervalued. Their situation around the world is a narrative that speaks of exclusion, neglect and even poverty. One of the main observations made by some scholars is the difficulty of finding official statistics that explain how many women work in fishing, in what areas they are operating, and their true contribution to society (Garcia-Negro and Zotes-Tarrio 2006; Göncüoğlu and Ünal 2011; Harper et al. 2013; Zhao et al. 2013). Bennet (2005) and Harper et al. (2013) go further, and discusses the lack of information regarding the gender relations in the fishing sector and how they are influenced by socio-environmental changes.

Other authors address the relevant barriers encountered by women to fight for their labor rights and to be considered fish resource managers. The secondary position of women in their organizations (often the Fishermen's Guild), and the lack of legal and administrative support have excluded them from fisheries policies and resources, leading them to the lower end of the fishing chain (Dias, Rosa and Damasceno 2007; Weeratunge, Snyder and Sze 2010; Zhao et al. 2013).

It is interesting to note that this phenomenon of inequality has been demonstrated in different countries, regardless of the level of development. Even in European countries, which are more advanced in terms of women's rights, women in fisheries remain invisible in many areas, with some exceptions, such as France, Portugal and Spain (Harper et al. 2013).

There is some consensus in the literature that this status of women has an origin rooted in the cultural aspects of the fishing universe (Bennet 2005; Davis and Gerrard

2000; Harper et al. 2013; Tindall and Holvoet 2008; Weeratunge, Snyder and Sze 2010). Fishing communities often replicate a sexual division of labor in which the main responsibility of women is reproductive work, while men are associated with the breadwinners of family. However, in many coastal communities, women practice fishing activities on land or on sea parallel to the children care. It means that they are engaged in fishing as well as men, but usually on a part-time basis.

On the other hand, men tend to occupy categories of fishing with more social status, in addition to dominating certain means of production that provide higher income, such as a boat or other fishing instruments. Meanwhile, as fisherwomen, their type of fishing is usually considered a “small fishing”, due to factors such as the use of artisanal technics or low technology, the low market value of some resources or even the low catch quota, depending on the zone (Hapke 2001; Harper et al. 2013; Hauzer 2013b; Magalhaes et al. 2007; Samuel 2007; Zhao et al. 2013).

That condition of inequity has, in effect, provoked the vulnerability of women's groups as both professionals and environmental managers. Without recognition and decision-making power, they will face serious obstacles to promoting a new model of sustainable management of resources based on their knowledge and experience (Bru-Bistuer 1995), but also to cope with accelerated environmental changes in the coastal zone, whether due to climate change or technological disasters such as the oil spill.

3.3 Changes in the coastal zone and oil disaster

A significant part of human activities take place in the coastal zone, which has undergone a deep and accelerated change in the last decades. Overpopulation, mass tourism, extensive agriculture, industrialization, major infrastructure projects, waste disposal, overfishing and offshore oil and gas industry are global phenomena that put pressure on the coastal zone, undermining the balance of the socio-ecological systems dependent on the marine environment. As a consequence, the social, cultural and economic sustainability of various social groups rooted in the coast is directly threatened (Crossland et al. 2005; Wilson and Wiber 2009).

Fishing communities have been threatened by damages in coastal areas (Frangoudes, Marugán-Pintos and Pascual-Fernández 2008). Some scholars draw attention to the particularities of some specific fishing categories that are linked to inshore marine habitats, such as mangroves, estuaries, beaches and rocky areas. These environments have received a great pressure of pollution, which has affected precisely women's groups working as shellfisherwomen, crab hunters and shrimp gathered (Bennet 2005; Dias, Rosa and Damasceno 2007; Patin 2004; Weeratunge, Snyder and Sze 2010; Wilson and Wiber 2009).

This means that changes in the coastal zone must be seen from a gender perspective. The main implication of coastal zone pressures is the decline in marine resources (Anugwom and Anugwom 2009; Dias, Rosa and Damasceno 2007; Weeratunge, Snyder and Sze 2010). If their livelihood and economic cycle are affected, the productive roles of women in fishing communities are endangered, which increases their marginal situation in the fishing community (Bennet 2005; Ikelegbe 2005; Weeratunge, Snyder and Sze 2010).

Currently, one of the main threats to women in fishery in coastal zones is the oil disaster. Oil spill events have occurred frequently throughout the world (Patin 2004). Vanem, Endresen and Skjong (2008) explain that only in the United States, in terms of volume, oil and petroleum derivatives are the main source of chemical pollutants that originate in shipping activities. In other respects, Dongdong et al. (2015) show that in China occurred 3,000 oil spill accidents during the years 1973-2011, most of them caused serious environmental, social and economic damages. Focusing on gender impacts, Ikelegbe (2005) exposes that in addition to stopping fishing activities and their impacts on family livelihood and incomes, fisherwomen in the Niger Delta face difficulties in receiving compensation proportional to their damages.

Comparing with other types of pollution, an oil spill is not the most frequent in the marine environment, but its consequences are often devastating. The persistence of its effects over time, and the fact that its damage encompasses both ecological and social factors, made the oil disaster a potential stress for the coastal zone (Boohene and Peprah 2011; Cheong 2011; de Soir et al. 2015; Hong et al. 2014; Otero et al. 2014; Palinkas 2012; Webler and Lord 2010), that is why the use of the term 'disaster' as a concept

A disaster is an unexpected event of great proportions, affecting a large number of people and/or the environment. Serious damage can affect human life in a number of areas, including livelihoods, economic and social infrastructure. But also a disaster can cause profound changes in the environment as a whole, causing disorders in the balance of natural systems, and the disappearance, reduction or mutation of the species (Blaikie et al. 1994; Ginige, Amaratunga and Haigh; Paul 2011; Pérez-Pereira et al. 2012).

In the case of the technological or man-made disaster, there are more specific characteristics. Its effects are chronic both for individuals and for the environment, and are usually associated with a high level of toxicity. Moreover, this type of disaster has its origin in failures of the human activities that apply the use of the technology in large scale. Examples are nuclear explosions, leakage of dams with mining waste,

explosion in toxic gas plants, and the oil spills (Blaikie et al. 1994; Cutter et al. 1994; Gill, Picou and Ritchie 2012; Paul 2011).

An oil spill is always a challenging element. The specificities of the spill make each event unique, because some factors can drastically influence the extent of damage, such as the characteristics of the oil, the environment, the human groups involved and especially the social capacity to deal with it. Thus, this type of disaster deserves an individual evaluation for each event (Dongdong et al. 2015; Patin 2004).

Webler and Lord (2010) strongly advocate the need to further investigate the human dimension of oil spill impacts. In particular, the authors focus on those social groups most closely associated with the marine environment, as they are most susceptible to change in the face of an oil disaster, such as women in fishery. Therefore, in order to prepare, mitigate or prevent changes, the key is to know the nuances of the socio-ecological system, and understand how the spill can affects this system.

Some scholars have demonstrated the serious consequences of an oil spill in fishing communities. Arata et al. (2000) reported a significant decline in the pink salmon fishery as the main impact of the Exxon Valdez spill for commercial fishers in Alaska. Born et al. (2003) showed how the Jessica oil spill changed the socioeconomic dynamics of a community of artisanal fishers in Galápagos as they stopped to fish to participate in the cleaning operations. Grattan et al. (2011) found a significant level of distress, depression and anxiety in fishing groups in Alabama and Florida following the Deepwater Horizon oil spill. Cheong (2011) addressed negative impacts such as distrust, anxiety and controversies about clean-up and compensation, but also positive changes in environmental awareness and participation of fishing communities affected by the Hebei Spirit spill. Gil, Picou and Ritchie (2012) reported how the BP oil spill in the Gulf of Mexico affected large number of people dependent on oysters, crabs, shrimp, mullet and other fishing resources due to significant declines in local fisheries.

As for each social group has a distinctive susceptibility to coastal changes; participation in the decision-making process involving the management of the affected marine environment should be open and more democratic (Alexander 2009; Evans, Gebbels and Stockill 2008; Haddow, Bullock and Coppola 2007).

Zagonari (2008) argues that the coastal management is a continuous decision-making process, so the best way to cope with threats to marine degradation is to avoid the top-down approach, and then to stimulate the community-based context. In the first scenario, what occurs is a unilateral government decision characterized by a lack of transparency, where citizens have little or no access to information. On the contrary, decisions based on the community-based context are made in co-partnership between

various stakeholders, such as government agents and the local community, which favors a more global view of coastal conservancy (Méheux, Dominey-Howes and Lloyd 2010; Zagonari 2008).

Some authors support that, since women in fisheries are one of the most affected by oil disasters, they should be included in the whole process of disaster management. Their local knowledge, skills and social and environmental experience can be a relevant contribution to reducing new accidents and overcoming damage to the marine environment (Anugwom and Anugwom 2009; Agarwal 1992; Agüera-Cabo 2008; Bru 1996; Martínez 2000).

4. The Case Study

Figure 4: Characteristic landscape of the Costa da Morte (Death Coast)

The Atlantic coast of Galicia, to the northwest of the Iberian Peninsula in Spain, has a marine ecosystem featured by its great biodiversity, variability and spatial complexity. These characteristics explain the fact that for centuries Galician was predominantly maritime and rural. This means that in these areas people historically had their livelihood partly originated by the sea and the mountain. Therefore, coastal communities grew around fishing, which has influenced their landscape, society, culture and economy (Allut 2003; Carvalho et al. 2012; Marugán-Pintos 2012).

Although the Galician coast communities have been very modernized, and the services, industry and construction sectors are now economically important, some of the local society in this region still depends strictly on the balance of the marine environment and the fishing activities, such as the shellfisherwomen (Allut 2003; Boada, Feijoo and Rieradevall 2005; Varela-Lafuente and Iglesias-Malvido 2000; Marugán-Pintos 2004).

4.1 The Galician shellfisherwomen

In the Galician coastal zone, shellfishing continues to represent a relevant occupation for women. In this region, women occupy around 75% of the workforce in shellfishing, and in some villages this is the third most important sector of job creation for women (IGE 2015). Therefore, there is a consensus in the literature in denominating the people who work in the shellfishing in Galicia of shellfisherwomen, since the presence of men in this work is minority (Frangoudes, Marugán-Pintos and Pascual-Fernández 2008; García-Negro and Zotes-Tarrio 2006; Laxe-González 2003; MAGRAMA 2016; Marugán-Pintos 2004; Marugán-Pintos 2012).

Although in some specific areas of Galicia shellfisherwomen catch species such as algae and sea urchins, they have specialized in the exploitation of molluscs and crustaceans (Frangoudes, Marugán-Pintos and Pascual-Fernández 2008; García-Negro and Zotes-Tarrio 2006; Marugán-Pintos 2004). The main resources managed by them are known locally as *berberecho* (*Cerastoderma edule* is the main species of cockle cultivated in Spain), *almeja* (*Ruditapes philippinarum*, *Venerupis corrugate* and *Ruditapes decussatus* are the main species of clams produced in Spain) and *percebe* (*Pollicipes pollicipes* is the main species of barnacle gathered in Spain).

The type of resource exploited and the specific site on the coast where they work define the sub-nomenclature given to women in shellfishing. Those who work in the sand on the beaches without the vessels gathering the cockle and clam are called the shellfisherwomen on foot, or simply shellfisherwomen (Figure 5). On the other hand, those working in rocky areas on the beaches gathering barnacle are called *percebeiras* (Figure 6). Both types of shellfishing professionals are conditioned by the tidal movement, the weather and the environmental balance of the estuarine zones.

Figure 5: Shellfisherwomen collecting shellfish on the beach with a shovel

Photo: Amanda Fadigas (2013)

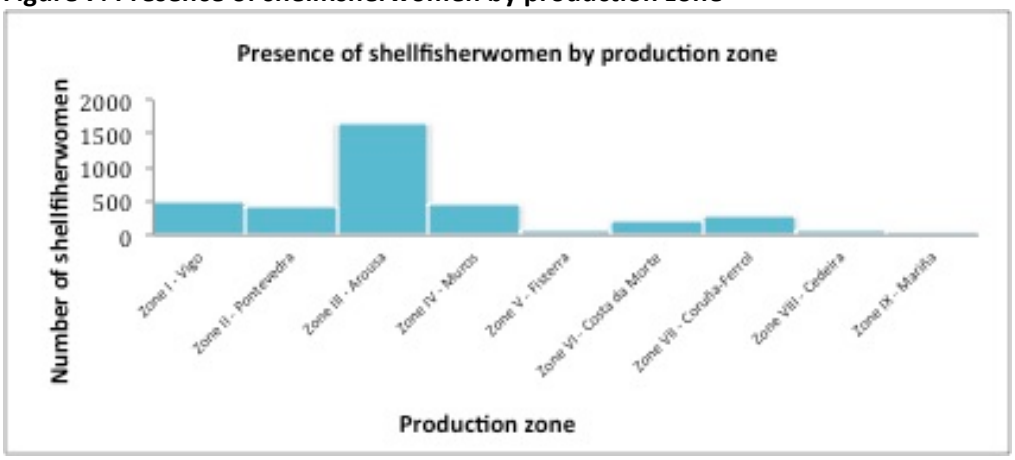
Figure 6: *Percebeiras* working in a rocky area

Photo: Amanda Fadigas (2013)

In spite of the difference in the nomenclature, to public administration they are all considered shellfisherwomen, since the *percebeiras* are a minority group in the entire Galician coast (García-Negro and Zotes-Tarrio 2006). That is the reason why this research adopted the term shellfisherwomen.

Moreover, the geographical features of the Galician coast influence the greater or lesser presence of shellfisherwomen along the coast. *Rías Altas* is the most rugged part of the coastline, with turbulent water, high cliffs and rocky zones. In addition, its beaches are small in extent as compared to the *Rías Baixas*. All these characteristics create less favorable conditions for shellfishing. On the other hand, the shellfisherwomen are mainly concentrated in the *Rías Baixas*. The estuaries inlets of the *Ría de Muros*, *Ría de Arousa*, *Ría de Pontevedra* and *Ría de Vigo* make up the *Rías Baixas* and are characterized by calm water, the occurrence of islands and extensive beaches. The shellfishing zones are classified into nine production zones (Figure 7).

Figure 7: Presence of shellfisherwomen by production zone



Source: IGE (2016). Own elaboration.

In order to work in shellfishing, shellfisherwomen must to be organized in *agrupaciones*, which are a kind of organization composed only by shellfisherwomen subordinated to the Fishermen's Guild (IGE, 2016). Currently, along the Galician coast there are 61 *agrupaciones*.

The process of organization of the shellfisherwomen in *agrupaciones* was gradual. Law 6/1993, of May 11, on Maritime Fishing in Galicia (España, 1993), was the legal instrument that provoked a first change to formalize shellfishing. Until the 1990s, people working in shellfish, mainly women, followed a disorderly productive pattern and away from a professional image. The shellfisherwomen legally assumed the direct participation of the resources from 1993, when they could form the *agrupaciones*. From this change, the shellfisherwomen could guarantee their autonomy to manage the resources through the Exploitation Plan, which determines the zoning, the number of working days, the limit of the people who can work as shellfisherwomen, the minimum catch size to each gathered species, and the period of closure of fishing (Frangoudes, Marugán-Pintos and Pascual-Fernández 2008; Marugán-Pintos 2004).

Sales systems have also changed (García-Negro and Zotes-Tarrio 2006). Since the 1990s all shellfish sold must to pass through a control in the *lonxa* (fish auction), and thus this shellfish becomes legal. Then, the shellfisherwomen began to establish a minimum price in the auction that varies according to each species, the market demand, and the zone where the resource was gathered. In spite of all these variables it is possible to estimate the average price of the main resources traded in the fish auction by the Galician shellfisherwomen (Table 1):

Table 1: Average price paid by kg at auction for species managed by Galician shellfisherwomen

Local name of specie	Scientific name	Average price
Berberecho	*Cerastoderma edule*	3,00 Euros
Almeja Japónica	*Ruditapes philippinarum*	8,00 Euros
Almeja Babosa	*Venerupis corrugata*	13,00 Euros
Almeja Fina	*Ruditapes decussatus*	20,00 Euros
Percebe	*Pollicipes pollicipes*	20,00 Euros

Source: Pesca de Galicia (2017). Own elaboration.

However, the dynamics of shellfishing in the Galician coastal zone have changed drastically over the last decade, affecting not only the price of resources at the auction but also the number of people working as shellfisherwomen. In 2001, IGE registered 8,286 people working in shellfishing, of whom 6,988 were women. This amount was significantly reduced to only 3,799, of which 2,838 are women in 2016 (IGE). At the

same time, pressure has increased on the coastal zone of several sources of pollution, and one of the most dangerous is the oil spill (Boada, Feijoo and Rieradevall 2005; García-Pérez 2003; Laxe-González 2003; Solana-Ortega and Solana 2007).

4.2 The Prestige disaster and the Galician coastal zone

In November 2002, along the Galician coast, there was one of the largest maritime transport accidents with oil pollution. The Prestige oil tanker crashed causing a spill of approximately 60,000 tonnes of crude oil (Figure 8). Black tides spread over more than 2,000 km of coastal areas, affecting mainly the Atlantic coastal of Spain, in the Autonomous Communities of Asturias, Cantabria and Euskadi. However the great impact was recorded in Galicia (Boada, Feijoo and Rieradevall 2005; Diz-Otero and Lois-González 2005; García-Pérez 2003; Laxe- González 2003).

Figure 8: The last days of the Prestige oil tanker

Source: La Opinión (2012).

The spill was developed in three black tides in different periods, as described in the following chronology recorded by the newspaper La Voz de Galicia:

- <u>The first black tide</u>
  It affected the *Rías Altas*, the northern part of the Galician coast, from November 13 to 19, 2002

- 11/13/2002 •The Prestige oil-tanker adrift on the Galician coast
- 11/14/2002 •The Spanish government decides to take the oil tanker 120 miles off the coast. The Prestige spills an oil slick of 37 km that is very close to the coast.
- 11/16/2002 •The black tide reaches the province of A Coruña, affecting 190 km from Fisterra to Arteixo. Dead animals impregnated with oil appear on the beaches.
- 11/17/2002 •The Spanish and Galician governments guarantee relief payments to affected people before Christmas.
- 11/18/2002 •In the north, the most affected area, sailors try to collect oil from the rocks with their own tools. The Spanish government sends the army to collaborate with the cleaning of beaches. The erratic course of the Prestige puts the Rías Baixas in danger.

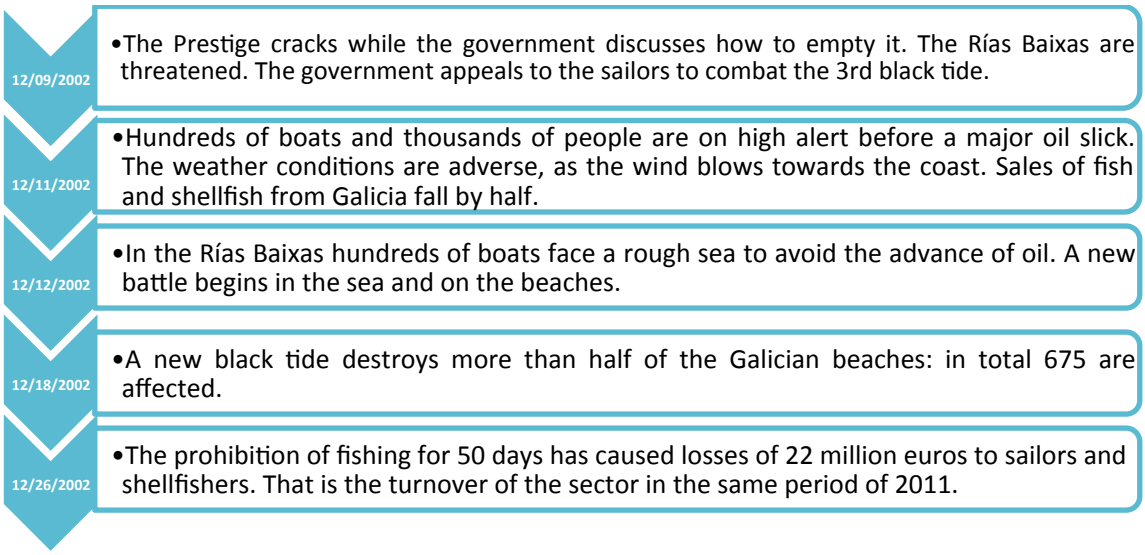
- The second black tide

  It affected the *Rías Altas* and the *Rías Baixas*, respectively the northern and southern part of the Galician coast, from November 19 to December 10, 2002

- 11/21/2002 •The first oil stains appear where the Prestige sank. There is a great lack of organization and tools. The beaches already have containers filled with oil, but the town councils do not know what to do with them because there is no information. Many volunteers who come to help can not work due to lack of resources.
- 11/23/2002 •New oil spills put Galicia in the worst hazard. A great oil slick is 140 km from Fisterra. The winds push it towards the northeast and, although it can not reach the Galician coast and go to France, everything is uncertain, since any change in the meteorological conditions could take it towards the Galician coast.
- 11/25/2002 •The sailors from Malpica and Porto de Son went fishing and returned with oil impregnated tools, which confirms that the spill affects not only the surface, but also the seabed.
- 11/29/2002 •The ports of the Costa de la Muerte and Arousa are about to receive 11,000 metric tons of oil. Hundreds of sailors and shellfisherwomen work hard all night to prepare their defense.
- 11/30/2002 •Galicia is powerless to face the impact of the 2nd black tide. The great oil slick produced after the Prestige's rupture and subsequent sinking threatens to cover miles of coast under a dense black veil.
- 12/01/2002 •Human tide against black tide. More than 200,000 protestors meeting in Santiago de Compostela to shout "*¡Nunca Máis!*" (Never More).
- 12/04/2002 •Arousa stops the black tide and the fight intensifies in the estuaries of Vigo and Pontevedra. 7,000 people distributed in 1,200 boats are mobilized along the *Rías Baixas*.
- 12/05/2002 •The French bathyscaphe Nautille shows evidence that the Prestige continues to spill oil and threatens Galicia with more black tides. Approximately 10,000 volunteers come from all over Spain to help clean the beaches.

- The third black tide

  It affected the *Rías Baixas*, the southern part of the Galician coast, from December 6 to January 8, 2002



Although the Spanish coast was the most exposed to the oil spill, Portugal and France also had their coastal areas threatened to a lesser extent. This led both countries to monitor the evolution of the spill, which allowed confronting the version presented by the Spanish government on the accident (La Voz de Galicia, n.d.). Constantly, the Spanish government concealed, denied or minimized the information, a fact that hampered the disaster management and was considered by civil society and environmentalists as a catalyst for damages (Coronel Arias et al. 2008; del Olmo García and Pintos Ager 2003; Rubí I Puig and Piñeiro Salgado 2003).

If one considers some indicators it is possible to realize the dimension of this environmental catastrophe. It is estimated that 250,000 seabird died, indicating that this was the largest catastrophe ever recorded in Europe and the second in the world, being surpassed by the Exxon Valdez in 1989 in Alaska. However, observing at the economical aspect, there is evidence that the Prestige disaster has overcome the disaster in Alaska due to the cleanup and recovery budget, which exceeded 2,500 millions of euros (Garza-Gil, Prada-Blanco and Vázquez-Rodríguez 2006; Laxe-González 2003; Surís-Regueiro, Garza-Gil, Varela-Lafuente 2007).

Some impacts of the spill were assessed on fishing communities. Garcia-Negro et al. (2009) emphasized the strong dependence of the Galician economy on fishing, and the losses suffered by the fishing activity and the production chain generated by it (Álvarez and Loureiro 2013; García-Negro, Villasante and Carballo-Penela 2007). Other studies focused attention on the important public expenditure to cover the aid relief of the fishing sector (Fuentes-Castro 2005; Loureiro-Garcia and Vázquez-Rodríguez 2006). Changes in the marine ecosystem were also registered (Bernabeu et al. 2009;

Bernabeu et al. 2013; Junoy et al. 2013; Marigómez et al. 2013); such as impacts on fish and shellfish populations (Abad, Bellido and Punzón 2010; Izagirre et al. 2014).

In this context of the Prestige disaster, there are still several gaps to be analyzed from the perspective of socio-environmental impacts. Especially the consequences of spill for shellfisherwomen were little studied in literature. When it was reported, they often appeared hidden behind the data of the fishing sector. Their specificities were not considered; both in terms of gender aspects and environmental conditions related to the shellfishing conservancy. These concerns base the development of the present study, as will be explained in the following sections.

5. Methods

Figure 9: Clams collected by shellfisherwomen in the estuary

The initial proposal for this study was to conduct quantitative-qualitative research, through the collection of data mainly in primary sources. However, from the first field visit I could see that the research would enrich if it were mostly qualitative rather than quantitative. The factor that most influenced this decision was the core of this work. It is an investigation that sought answers that could explain a phenomenon rarely studied: a group of women directly related to the environment that was affected by an oil disaster.

A gender research approach favors observing a complex process related to the distribution of power and the symbolic perception of events that are often not associated, such as gender and the environment. In this sense, qualitative research allows to obtain deeper answers; since gender issues are related to complex dynamics of social, culture, norms, beliefs, values, interests and experiences (Scott 1986; Nagy Hesser Biber 2007).

Therefore, the gender component of this study led me to note that it was not enough to know whether shellfisherwomen were vulnerable to an oil spill or not, but how and why they faced certain vulnerability factors. Similarly, it was not enough to know the percentage of shellfisherwomen who had observed changes in their area after the Prestige disaster, but it was essential to understand why some environmental changes had affected them, and how these impacts persisted in their socio-environmental dynamics. Finally, it would not be enough to answer the research questions to know just how many shellfisherwomen were engaged in beach cleaning or other measures taken by them, it was necessary to know more about why they did these resilient actions, how they achieved it and what obstacles they encountered in that process.

Therefore, all these questions found an appropriate place in qualitative research. On the other hand, I observed that many data that I had planned to collect through quantitative research could be obtained in secondary data. From the informal interviews conducted at the field visit, the leaders of the shellfisherwomen showed a very rich knowledge of the phenomenon studied, as well as the ability to delve into why their responses. As a result, the semi-structured in-depth interview was the best tool to explain the facts in more detail. A questionnaire would certainly give answers, but it would not explain the phenomenon in its complexity.

Therefore, the study focused on qualitative research. In spite of the small sample of respondents (15 in total), the results showed a significant correlation in addition to finding support in bibliography and official data, suggesting that it was indifferent to continue doing peer interviews (Rossman and Ralis 2003). To obtain some quantitative data on the shellfisherwomen group, we eliminated the surveys and opted for

secondary sources. On the other hand, and in order to enrich the data, it was decided to extend the collection of qualitative data, encompassing a greater geographic diversity and including other actors to participate in the study.

5.1 Research design

This doctoral thesis was conducted between January 2013 and April 2017. The research is based on qualitative methods with the use of primary and secondary data. The primary data were collected by performing semi-structured interviews with three groups of participants selected through the expert knowledge (Rossman and Rallis 2003). The first group of participant was composed by Galician shellfisherwomen, the second by non-governmental agents, and the last by researchers. The interviews were made following the commitment of anonymity with the interviewees, which included concealment of any information that could identify them, such as the name of the zone studied. The aims of these interviews were:

- Restore the collective history of Galician shellfisherwomen and their link with the marine environment;
- Identify their experience with the impacts of the Prestige oil spill;
- Verify the main features of its participatory actions in the recovery and prevention of risks in the area affected by the oil spill.

The secondary data were extracted from the database of Galician, Spanish and international institutes of statistics, fishing and environment. Quantitative data were collected to define the social-economical and fishing profile of the communities studied in the Galician coastal zones. Also were collected qualitative data from secondary sources, mainly from government and non-governmental institutions, newspapers, television broadcast, websites, and online photo galleries, in order to reconstruct the history of the Prestige disaster through elements related to the shellfisherwomen and the shellfishing zones. Moreover, the Spanish legal framework was revised to examine its evolution regarding the protection of the coastal zone against oil pollution.

5.2 Participants

A. The first group of participant was composed by Galician shellfisherwomen. The selection criteria were women with: a senior position in the *agrupaciones*; leadership profile; deep knowledge of the shellfisherwomen history; awareness of the environmental evolution of the zone; own experience with the Prestige disaster. It was selected 11 women in the different 6 studied zones to participate in the in-depth interviews.

B. The group of non-governmental agents consisted in participants selected through the following criteria: a senior position in the NGO; acting in environmental issues;

knowledge of artisanal fishing in Galicia; knowledge of the environmental aspects in the Galicia coast; on-site experience with the Prestige disaster. Two participants met the requirements.

C. Senior researchers composed the third group of participants. Two investigators were selected based on their research background, with the aim of offering complementary perspectives on the subject of study. The first participant has a deep knowledge of the Galician shellfisherwomen group, its history, system of organization, gender roles, and link with the marine environment. The second participant is an expert in Galician fishing communities, with knowledge of small-scale fishing and its anthropological, economic, social, environmental and gender aspects, besides to having had on-site experience with the Prestige disaster.

5.3 Instruments

A. The main research instrument used was the interview, generating qualitative data to reach the specific objectives. The interview guide was developed from informal interviews and field observations, supported by bibliographical references (see section 3.3.1 and 3.4.3.1 for more details). Each objective generated a thematic approach based on a particular theoretical framework (Table 2). The guide was adapted to cover in deep the field of knowledge of each group of participants. Thus, three interview guides with open questions were created through of a common content, but with questions directed to the specific knowledge of shellfisherwomen, non-governmental agents and researchers selected.

Table 2: Main topics of interest developed in the interviews according to each specific objective

Id.	Subchapter	Specific Objective	Theoretical framework	Themes explored in the interview guides
I	4.1	Verify the vulnerability factors that put shellfisherwomen at risk in face of the Prestige disaster	Gender vulnerability (Aguilar-Revelo et al. 1999; Blaikie et al. 1994)	History of women in shellfishery Relevance of shellfishery in marine conservancy Role of shellfisherwomen in marine conservancy Environmental characteristics of the coastal zone before the Prestige disaster Previous experience with oil spill events Preparedness to prevent oil spill contamination

				Coastal zone protection protocols
II	4.2	Identify the socio-environmental impacts caused by the Prestige spill in the Galician coastal zone and its implications for shellfisherwomen	Gender impact assessment (EC 1998; EIGE 2016; Webler and Lord 2010)	Shellfisherwomen's preparedness to face oil disasters Disaster management consultations with shellfisherwomen Main changes in the zone after the oil disaster Consequences for shellfisherwomen after the spill Social-environmental conditions of the zone in the last 10 years The damages suffered by shellfisherwomen in the last 10 years
III	4.3	Identify the main features of the shellfisherwomen actions in the context of damages prevention and the recovery of zones	Gender and Resilience actions (Enarson 2000; Alexander 2009)	The consequences of the Prestige disaster for shellfisherwomen The immediate reaction of the shellfisherwomen to the Prestige damages The long-term actions of shellfisherwomen after the Prestige damages The learning acquired by shellfisherwomen after the Prestige disaster Social-environmental conditions of the zone in the last 10 years The main changes in shellfishery after the Prestige disaster The shellfisherwomen relevance in the conservancy of marine environment The contributions of shellfisherwomen in a hypothetic new oil spill

Source: Own elaboration

B. The fieldwork was registered in field notes that were used to confirm the activities carried out, to verify the information of the studied localities and to record the content of informal interviews and events observed in the field.

5.4 Proceedings

5.4.1 Bibliographic review

This activity was developed from the beginning of the study to the completion of the writing of the thesis to keep the sources updated. Priority was given to the most recent sources and, in the case of papers, journals with an impact factor. However, the older sources were also included, as long as they were aligned with the research object. It was consulted online platforms and database of the main portals with international and national bibliography. The bibliographic collection of the University of Girona (UdG) and the Center for Environmental Law in Tarragona (CEDAT) of the Department of Public Law of the Rovira i Virgilli University (URV) were also visited.

The search focused on four major issues:

- Research methods: qualitative and quantitative methods; social research techniques, specifically the elaboration and execution of interviews; research and inequality; investigative procedures with a gender perspective; treatment and interpretation of qualitative data.
- Gender and environment: gender and coastal territory; participation of women in environmental conflicts; women and environmental management; women in fishing; gender and oil spill.
- Disaster, coastal changes and oil spill: risk management; technological disasters; human dimension of oil pollution; oil spill in coastal zones; gender and disaster; vulnerability; social impacts; resilience.
- The Prestige disaster: historical background; environmental, social, economic issues; specific sources related to fishing and the disaster.

5.4.2 Review of legislation

At this stage, the search was concentered on legal instruments of the Autonomous Community of Galician, Government of Spain and international institutions, normally European Union. The investigation was carried out in the official database of each instance, in addition to the collection of the CEDAT of the Department of Public Law of the URV. The review included legal instruments related to marine pollution, protection of coastal zones, fishing and shellfishing. This activity was also developed throughout the research.

5.4.3 Data collection

5.4.3.1 Fieldwork

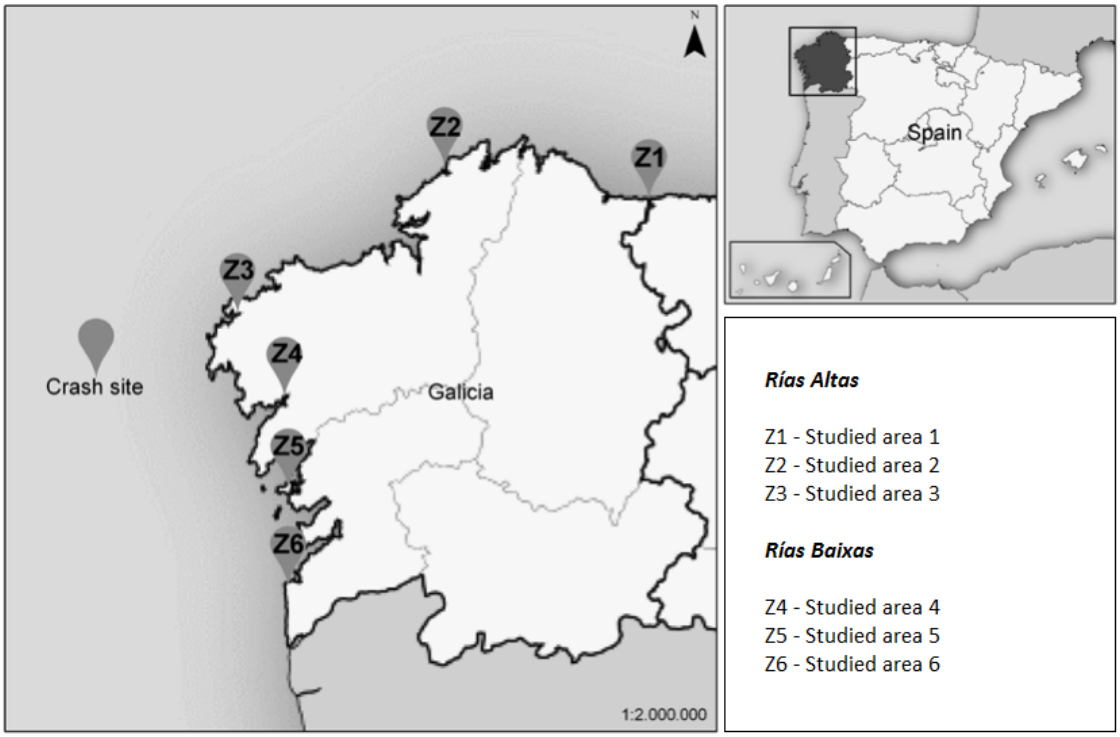
The main goal of the fieldwork was to collect the primary sources in six stages:

- Find and contact key informants: E-mails and telephone calls were made to professors and researchers who had worked in the affected area of the Prestige. The aim was to find reliable information that could facilitate the fieldwork, as a reference contact in local organizations.
- Delimitation of study areas: from the information obtained through key informants and Internet research on the areas affected by the Prestige spill, four probable study areas were selected in the *Rías Baixas*, Galicia. The criteria for determining the eligibility of the zones were to have been an area affected by the Prestige and have a significant representation of shellfisherwomen.
- 1st field visit: this visit was carried out in April 2013 in four fishing communities in *Rías Baixas*. It had four primary objectives; to know the local reality, to define definitive areas of study, to define the expert shellfisherwomen to participate in the research and to select information to elaborate the interview guide. Several informal interviews were conducted to ensure that the areas visited met the research requirements. In this sense, a locality was discarded. In three final locations were selected shellfisherwomen to be interviewed.
- 2nd field visit: the aim of this visit in Juny 2013 was to conduct interviews in three locations in *Rías Baixas*. Were made 1 interview in Z4, 2 in Z5 and 5 in Z6 (Figure 10). The interviewees gave their verbal consent to participate in the study on audio recordings. In-deep interviews lasted an average of one hour, and were recorded digitally. The questions were asked in Spanish, however the participants were free to choose to respond in Spanish or in Galician. Interviews were conducted whenever possible in the *lonxas* (fish auction), to collect data by direct observation on its structure and functioning.
- Expansion of study areas: The 2nd field visit indicated the need to include in the study some zones affected by the Prestige spill in the *Rías Altas*, Galicia. Therefore, new key informants were contacted as well as new research was done on the Internet to confirm that expanding the study area could benefit the research. Thus, following the eligibility criteria of the zones, three more locations were selected in the *Rías Altas*. The possibility of expanding the type of participants was also discussed, and two other groups were included: non-governmental agents and expert researchers. New participants were selected and contacted by phone calls to concrete the 3rd field visit.
- 3rd field visit: This stage occurred in two phases. The first was executed in July

2014 in three locations in the *Rías Altas*. The second phase was held in September 2014 in Madrid. As well as the interviews conducted in the 2nd field visited, the interviews were digitally recorded and lasted approximately one hour, the interviewees gave their verbal consent, and in this case all of them performed the answers in Spanish. Also in this field visit, the interviews of the shellfisherwomen were made whenever possible in the *lonxas*.

- *Rías Altas*: three shellfisherwomen were interviewed, one in each area studied in the *Rías Altas*: Z1, Z2 and Z3 (Figure 10). In addition, an interview was coducted with a non-governmental agent and another with a researcher, both based in A Coruña.
- Madrid: Two interviews were conducted, one with a non-governmental agent and another with a researcher, both based in Madrid.

Figure 10: Location of sampling site along the Galician coast



Source: Own elaboration.

5.4.3.2 Search in several databases

Several online databases were used throughout the research execution to collect secondary sources, adding quantitative and qualitative data to this study. The sources used for the research can be found in **Chapter 10** of the References. The main databases accessed were:

- At the level of the Autonomous Community: *Consellería do Mar* (Department of the Countryside and the Sea) of the Autonomous Community of Galicia, and

IGE.

- At the level of the Spanish Government: Ministry of Environment, Agriculture, Fisheries and Food (MAGRAMA) of the Spanish Government.
- At International level: European Commission for the Environment, European Commission of Maritime Affairs and Fisheries, and Centre of Documentation, Research and Experimentation on Accidental Water.
- Press database: La Voz de Galicia, and El País, both newspapers online.

5.4.4 Data analysis

5.4.4.1 Data processing and analysis

The processing of the interviews was carried out in different phases. At first the anonymous data was made, to ensure the privacy of the interviewees. Then, a register was created to organize, identify and feature each of the 15 interviews conducted. Finally, the researcher himself made the transcriptions.

The researcher performed the data analysis exclusively by hand. To achieve a better efficiency of the qualitative data, the analysis was developed through a meticulous process that required a long period of dedication of time. The process was divided into four steps according to Saldaña (2009):

- Pre-analysis and organization: the first step was to re-check the background of the research to guide the data analysis, so it was possible to identify which questions the data should answer. All interviews transcripts were carefully read to know the general reported contend, and make decisions to facilitate coding. As the interviews were semi-structured, the participants' discourse was not lineal; therefore the content of each document was organized according to the order of each question (Saldaña 2009). Questions were adapted to become major topics, with which of the 14 questions were returned in 14 topics. Then each transcript file was duplicated, and one copy with a column to the right was prepared to write down the codes.
- First Cycle coding: the material was read twice to do the First Cycle coding. Next, the codes were assigned alternating coding systems (Saldaña 2009). The In Vivo system created codes based on the literal speech of the interviewee, selecting a word or a short phrase with a strong meaning. The Process system allowed to elaborate codes that refer to an action that can stand out as unique, strategic, regular, etc. Finally, the Descriptive system helped to reflect in a word or a short fragment the basic theme in the speech. In this cycle 165 codes was created in total.

- Second Cycle coding: This step has as main goal to summarize the codes found in the First Cycle in smaller sets of response categories (Saldaña 2009). The analysis consisted of classifying, prioritizing, integrating and conceptualizing the 165 codes and condensing them into 53 specific categories. To this it was used the Pattern system that works a meta-codes with the function of extracting the main theme of each code, reuniting it together in a unity of analysis. Both the categories and the codes were reviewed twice so that the investigator and the supervisor to ensure fidelity to the data collected.
- Data integration: the last step was to control the quality of data (Denzin and Lincoln 2003). It focused on verifying the primary and the secondary sources, analyzing their coincidences and divergences. When matches were obtained, the information was straightened. On the other hand, when divergences occurred they were analyzed to understand what they were due.

5.4.4.2 Data interpretation

Once the codes and categories were created, they were related to each specific objective. Thus, the interpretation of the data was performed according to the analytical categories of vulnerability, impact and resilience (Table 5.1), which generated three subchapters of results.

6. Results

Figure 11: *Percebeiras* cleaning and selecting *percebe* in the fish auction

6.1 Vulnerability factors of shellfisherwomen in the face of oil spill events: an analysis of the Prestige case

Figure 12: An elderly shellfisherwomen gathers shellfish at low tide

6.1.1 Abstract

Increasingly frequent disasters involving oil spills in coastal zones highlight the vulnerability faced by women's groups that are highly dependent on the marine environment. Based on the theoretical contribution of feminist environmentalism and the interpretative approach of the pressure and release model (PAR model), this paper verifies the progressive vulnerability of Galician shellfisherwomen in the period prior to the 2002 Prestige disaster in Spain. The main findings reveal the marginal position occupied by shellfisherwomen within the fishing sector. Moreover, they demonstrate the shellfisherwomen's dependency on a fragile coastal zone constantly threatened by pollution yet lacking adequate protection measures. This combination of factors exposed the social-environmental system maintained by shellfisherwomen to the risk of an oil disaster, increasing the vulnerability of women in that region. This study employs a gender vulnerability analysis to better understand oil disasters, and makes recommendations to improve future disaster preparedness and response, thereby benefiting people at risk.

6.1.2 Introduction

The world's current dependency on petroleum has increased oil spill hazards for fishing communities in coastal zones (Lin, Shih and Chiau 2013; Rahikainen et al. 2014; Rozas, Minello and Henry 2000). These technological disasters have meant environmental, cultural, social, and economic losses for groups with direct links to the marine environment. However, the literature on disasters has shown that social groups are not exposed to the same degree of risk, and that women are among the most vulnerable (Childs 2006; Eklund and Telier 2012; Reyes and Lu 2016). Therefore, the heterogeneity of a fishing community provides relevant clues to understanding the mechanisms that lead to fisherwomen vulnerability.

Despite advances in disaster studies, the relationship between gender, vulnerability and oil spills has not been analyzed enough. There are still many gaps in our awareness of the vulnerability to oil spills of women's groups, especially those closely connected to the environment. To better understand this phenomenon, this paper expands the discussion of gender vulnerability and technological disasters, analyzing the progression of shellfisherwomen vulnerability factors prior to the Prestige oil spill disaster on the Galician coast, in northwest Spain, in 2002.

The second section of this paper aims to intersect three issues: feminist environmentalism, gender vulnerability, and technological disasters. Then, it explores the topic of vulnerability assessment as a viable way to approach disaster studies from a gender perspective. Moreover, it presents a review of the Prestige disaster and highlights some relevant gaps. Subsequent sections present the study methods, the main results and discussion, and the conclusions.

6.1.3 Theoretical framework

6.1.3.1 Feminist environmentalism, gender vulnerability and technological disasters

Studies of gender and the environment have expanded interpretations of the relationship between nature and society. New interpretations appear when social homogeneity breaks down and differences are observed between the way women and men interact with nature. Agarwal's (1992) concept of feminist environmentalism assumes that these differences originate in gender, implying differences in the material reality of women and men and, consequently, in their specific involvement with the environment. The gender concept is understood as behaviors and roles assigned to sexed bodies that vary depending on the historic, social and cultural contexts of a specific society (Scott 1986).

Gender condition does not explain the entire distribution of power and inequities between men and women. But when factors such as class or race are added to it, it is

easy to identify the social conditions that put women at socio-environmental risk when they face an environmental disaster (Agarwal 1992; Eklund and Telier 2012; Enarson 1998; Fakhruddin and Rahman 2014; Jahan 2008).

The literature does not contain any references to the precise concept of gender vulnerability. However, according to Blaikie *et al.* (1994), vulnerability is related to a group's capacity to prevent, act, and withstand the effects of a disaster. Thus, in this study, gender vulnerability is conceptualized as a set of gender features of a particular social group that make them more prone to a disaster's effects as well as less quick to recover from its damages. This kind of vulnerability is strongly related to women's dependence on natural resources and their accessibility to them (Agarwal 1992; Awumbila and Homsen 1995).

In the disaster literature, the perspective of gender vulnerability is relatively recent and represents an important improvement in disaster interpretation (Childs 2006; Enarson 1998; Fothergill 1999; Reyes and Lu 2016; Sadia et al. 2016). However, women's vulnerability has been analyzed much more in natural disasters than in technological disasters. There is a relevant gap between gender vulnerability as a social construct and the particular way it manifests itself in the context of technological disasters.

Technological disasters are the consequence of the current technology dependency, mainly in developed countries but increasingly in developing countries. This technocentric paradigm is dangerous because it generates a common belief that technology is trustworthy, which provokes a lack of concern for the usually chaotic and uncontrollable damage it can cause (Cutter, Tiefenbacher and Solecki 1994; Paul 2011).

Moreover, technological disasters usually bring catastrophic consequences, especially in terms of toxic pollution. Some researchers have reported intoxication problems among women, due to both heavy metals (Catalán-Vázquez, Riojas-Rodríguez and Pelcastre-Villafuerte 2012) and petroleum (Anugwom and Anugwom 2009). However, these studies present two limitations. First, they only focus on the diseases that affect women in contaminated zones and do not consider the factors that place women in these vulnerable circumstances. Second, they consider 'women' as a homogeneous social category, without considering the particular implications of technological disasters on women who have a close connection with the environment. It is therefore relevant to adopt a gender vulnerability perspective in technological disasters.

6.1.3.2 A gender perspective on the assessment of vulnerability in technological disasters

Blaikie *et al.* (1994) interpret vulnerability not as a static circumstance, but as a dynamic process produced by a combination of factors. Consequently, they developed the pressure and release (PAR) model, which systematically assesses the degree of vulnerability of certain social groups. The root causes of vulnerability are the basis of a complex social problem that defines the characteristics and qualities that put certain groups in a marginal situation. The PAR model reveals the dynamic pressures that act on groups and create the unsafe conditions they face.

The PAR model was initially developed to assess natural disasters. However, its developers recognized its versatility and potential for application in different contexts, such as technological disasters. This is because scholars do not consider natural disasters to be acts of god, but rather a result of inequalities, negligence and other human actions that expose people's vulnerability. So, in this point, opinions about the causes of natural and technological disasters converge.

Moreover, although Blaikie *et al.* (1994) did not consider a gender perspective when they developed the model, they appreciated that the association between gender and vulnerability, while still new, was extremely necessary after gender studies had led to a broader understanding of the structure of vulnerability. To fill gaps in the PAR model, one relevant option is a gender field diagnostic study (Aguilar-Revelo et al. 1999). This useful tool evaluates a problem by considering the specific qualities of women and men, and observing reality from a multi-factorial perspective, like the PAR model. When both tools are connected, the results are much richer, deeper and nearer to reality. Therefore, they were chosen to guide this research.

6.1.3.3 A review of the Prestige Case

In recent years, the Galician coast of Spain, which is vital to fishing and has a complex environment and a highly diverse ecosystem, has been characterized as a high risk marine catastrophe zone (Allut 2003; Boada, Feijoo and Rieradevall 2005; García-Negro, Villasante and Carballo-Penela 2007; Varela-Lafuente and Malvido-Iglesias 2000). In November 2002, the Prestige oil tanker ran aground in an area known as the Coast of Death, in Galicia. Approximately 60,000 metric tons of fuel oil spilled, ranking it among the largest maritime transportation catastrophes with oil contamination in the world. The spill spread over 600 km of the Spanish coast. It affected the autonomous communities of Asturias, Cantabria, Euskadi, and Galicia, which was impacted most, with damages that have persisted over the years (Abad, Bellido and Punzón 2010; Boada, Feijoo and Rieradevall 2005; García-Negro, Villasante and Carballo-Penela 2007; Laxe-González 2003).

An important characteristic of the Galician coast is the development of artisanal fishing activities. In this region, shellfisherwomen represent a significant group, with great social, cultural, and economic relevance. According to the Galician Statistical Institute (IGE) (2001), in 2001, one year before the Prestige disaster, of the 8,286 people working in shellfishery, 6,988 were women. The great dimension of this disaster revealed the vulnerability of these fishing communities to oil spills (Abad, Bellido and Punzón 2010; Garza-Gil, Surís-Regueiro and Varela-Lafuente 2006), but each group was vulnerable to this stress factor in a different way, in accordance with its particular circumstances.

Knowing the circumstances of shellfisherwomen in the period prior to the Prestige accident is important for four reasons. First, it explains how the gender vulnerability of shellfisherwomen develops before an oil spill disaster. Second, it gives us guidelines to understand the impact that the Prestige disaster could have had on this group of women. Third, generating a portrait of the period before the disaster allows us to know in future studies if preparedness and response to technological disasters in this region have changed in recent years. And finally, it reveals that despite shellfisherwomen being relevant to fishing territory management, the degree to which they were disturbed by this disaster was never specifically recorded.

6.1.4 Methods

6.1.4.1 Participants

At first, only shellfisherwomen were considered for participation in this study. However, the topic created a considerable amount of mistrust among them, mainly because the Prestige disaster was a polemic issue involving political partisanship. This limited the involvement of more shellfisherwomen in the study. It was therefore decided to include other expert groups to enrich the data. This qualitative study is based on a sample of 15 participants selected for their expertise knowledge (Rossman and Rallis 2003). Three groups of experts were consulted: shellfisherwomen, agents from non-governmental organizations (NGOs) and researchers.

The shellfisherwomen group (*n* = 11) consisted of senior shellfisherwomen and leaders with in-depth knowledge of the studied area and a history of activism in fishing collectives, all witnesses to the Prestige disaster. The NGO agents (*n* = 2) were seniors agents with previous knowledge of the zone and on-site experience at the moment of the Prestige spill. Finally, the researchers (*n* = 2) were senior researchers with deeper expertise and complementary perspectives on the shellfisherwomen's collective.

6.1.4.2 Instruments

Participants were interviewed in depth, thanks to semi-structured interview guides. To better explore the expertise of each participant group, three guides were developed to

adapt the interview approach to the knowledge that each group could contribute. The interview guides, based on the methodology proposed by Aguilar-Revelo *et al.* (Aguilar-Revelo et al. 1999), allowed elaborate diagnostics from a gender perspective. Questions covered the themes presented in Table 3.

Table 3: Major themes of interest developed in interviews about the period prior to the Prestige disaster

THEMES EXPLORED BY INTERVIEW GUIDES
1. History of women in shellfishery
2. Relevance of shellfishery to Galicia
3. Role of shellfisherwomen in marine conservancy
4. Environmental characteristics of the coastal zone before the Prestige disaster
5. Previous experience with oil spill events
6. Preparedness to prevent oil spill contamination
7. Coastal zone protection protocols

Source: Own elaboration based on Aguilar-Revelo et al. (1999)

6.1.4.3 Procedures

Data collection and fieldwork

Data were collected from February 2013 to December 2014.

In the Galician coastal zone, visits were made to localities that had been affected by the Prestige disaster and had a large number of shellfisherwomen activists. Prior to that, sources such as the Galician Institute of Statistics, newspapers articles, expert researchers and governmental organizations were consulted to pre-select localities with those characteristics. Then, fishermen's collectives were contacted in these localities to find shellfisherwomen leaders interested in participating in this research. Finally, field trips were taken to Galicia's two big estuarine zones: the *Rías Altas*, to the north, and the *Rías Baixas*, to the south. Three localities were selected in the *Rías Baixas* in March and June 2013, and three others to the *Rías Altas* in June 2014. To maintain interviewee anonymity, the names of localities were kept secret. The chosen locations were dispersed along the coast, maintaining a minimum of sample heterogeneity.

A similar strategy was used to identify the other two groups of participants: NGO agents and researchers. Through a collaborative informant network, created for NGOs, Spanish universities and research centers, it was possible to find participants with the desired profile.

Individual interviews were held following a schedule arranged according to each respondent's availability. Each interview usually lasted over one and a half hours and

was conducted mostly in Spanish, except two interviews in which Galician was used. All were digitally recorded, and respondents were given a verbal guarantee of anonymity.

In addition to the interviews, data were also gathered from participative observations recorded in field notes, newspaper articles, reports of governmental and non-governmental institutions and statistics from Galician institutes.

Data analysis

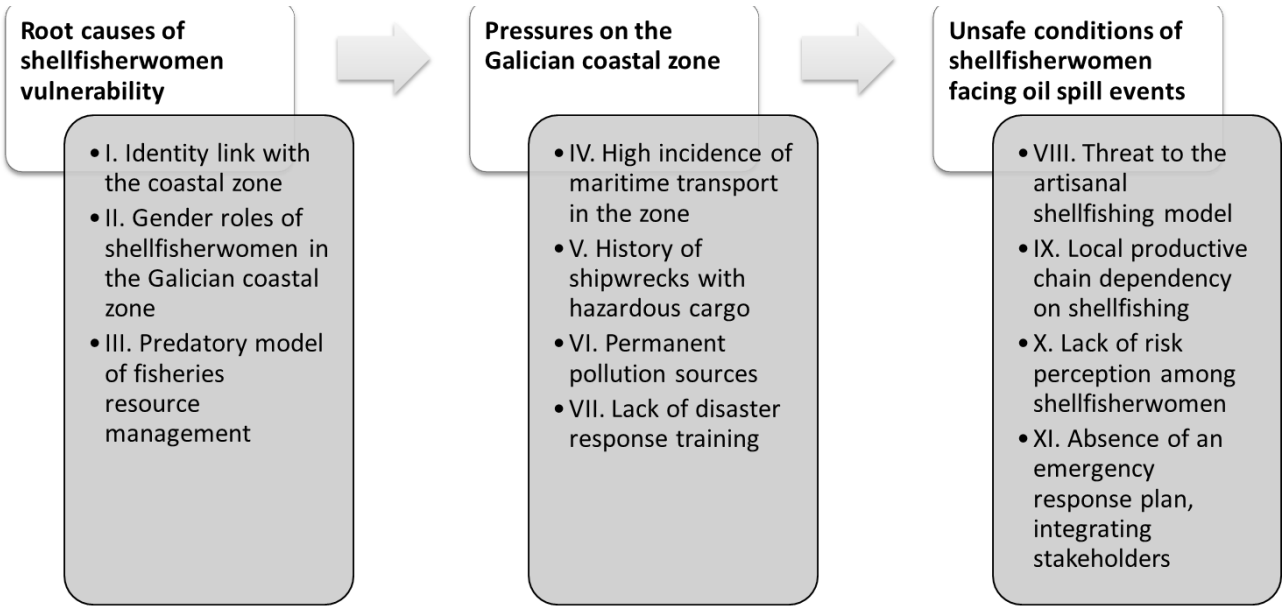
The interview data were anonymized, as had been guaranteed to the participants. The interviews were then transcribed using a word processor (Denzin and Lincoln 2003). Afterward, the transcripts were manually coded in two cycles using qualitative coding methods (Saldaña 2009) and interpreted according to the PAR model (Blaikie et al. 1994), following these steps:

- Initially, the interviews were carefully read to provide in-depth knowledge of the data. Then each transcript file was duplicated, and one copy was prepared with a column on the right to note the codes.
- In First Cycle coding, a code was assigned to each transcript paragraph alternating coding systems: In Vivo (derived from the participant's own speech), Process (when it refers to an action) and Descriptive (to identify the basic topic in the fragment).
- The Second Cycle summarized the codes found in the First Cycle into smaller sets of response categories. For this stage, the Pattern coding method was used to identify emergent topics. In this study, to ensure fidelity to the codes, 11 response categories were identified and revised twice by two different researchers.
- Once the codification process was concluded, the response categories were analyzed and organized according to the theoretic content of each of the following sections from the PAR model: root causes, dynamic process and unsafe conditions.

6.1.5 Main findings and discussion

Qualitative data processing identified eleven response categories or vulnerability factors that describe vulnerability from the shellfisherwomen's perspective in the pre-Prestige scenario. Figure 13 represents how response categories are grouped and connected with each other, based on the PAR model structure. The following sections will treat each vulnerability factor in greater depth.

Figure 13: The progression of shellfiserwomen before exposure to the Prestige disaster, in Galicia, Spain. Linking factors that led to a specifically vulnerable situation for Galician shellfisherwomen before the oil spill disaster



Source: Own elaboration based on the PAR model.

6.1.5.1 Exploring root causes of shellfisherwomen vulnerability

I. Identity link with the coastal zone

According to the interviewees, shellfishing has been traditional along the Galician coast since antiquity. Until the 1960s, the local economy was based on subsistence agriculture combined with seasonal fishing. Shellfishing served to supplement food and family incomes in this region until the 1990s (Marugán-Pintos 2004).

> *"A ver, todo el marisqueo ya es muy antiguo, antes claro, empezarías, hace muchos años, empezarías para comer, o ni siquiera para eso, a lo mejor para poner de abono en las fincas, en la tierra... Pero claro, después ya fue cuando empezó a tener salida el marisco, y tal, es claro, después ya ibas pues, por ejemplo, mi madre que iba... pero claro, no iba como se va ahora, sólo iba cuando había una marea buena, pues iban y se cogía un cubo, se traía un cubo lleno traía un cubo lleno. Escogía el mejor y venía vendiendo por las casas, las compradoras, y después lo que era el más pequeño o más inferior pues se quedaba en casa, se hacía un arroz, lo comías entiendes? Era una ayuda en la casa. (…) Mira, hasta ahora, hace unos años atrás, solo habían mujeres. Hace a lo mejor diez años, empezó a haber algún hombre."*
>
> Participant 6 - Shellfisherwomen

As recalled by the interviewees, men and women participated differently in shellfishing. The men were mainly fishermen who occasionally worked in shellfishing when the sea was too rough, while the women were occupied full time in this activity. A network of grandmothers and mothers developed shellfishing with a high degree of socialization and strong territorial roots, which contributed to strengthen its identification with the coastal zone. For this reason, identity emerged as a relevant root cause of vulnerability. Three identity spheres were observed: individual, cultural, and territorial.

In the individual sphere, shellfisherwomen thought of the sea as a great entity to which they belonged and which formed the basis of their lives. As a result of their personal life experience, they repeated terms that evoked the sea as an intrinsic and inseparable element of themselves, and the sea became an important aspect of their individual identity.

> *"Yo el mar lo viví, yo el mar lo viví. En un programa de la televisión decía que el mar tira. El mar es algo tan grande, tan grande... Es que lo vivimos sabes? Es que es una cosa muy grande, el mar es algo que te atrae porque comprendo la vida del marinero que no gana hoy pero mañana va con la esperanza de recoger, y mañana no coge y dice "y a ver si mañana, y a ver si pasado". El mar es algo... es como un imán, a mi por lo menos... el mar me atraía. Yo si lo que trabajaba en el mar lo tuviera que hacer en la tierra no lo hacía, no lo hacía, no lo hacía en el campo. El mar es para mi hasta era relajante."*
>
> Participant 10 - Shellfisherwomen

However, this link to the sea depended on each shellfisherwoman's profile. The more prominent one included women from traditional fishing families. The other profile includes women for whom the sea has been present in their lives but who don't have a background in fishery. The profiles have a common characteristic: most of the interviewees show great satisfaction in being shellfisherwomen, despite the difficulties of the job.

Shellfishery has also strongly influenced cultural identity in the coastal zone. Women are primarily responsible for the care of children. Until the 1990s, they could be taken to the beach during working hours. This enabled women to involve children in the marine environment and to transmit their shellfishing culture through generations.

> *"A ver, desde el punto de vista económico tiene su importancia, tiene más importancia en general de la que se le ha dado. Pero yo creo que la importancia del marisqueo en Galicia no tiene tanto que ver con lo económico, aun que yo tampoco lo despreciaría, porque creo que es un elemento a se tener en cuenta, sino con una continuidad de una cultura pesquera que es lo que hace a Galicia*

una zona diferente, en ese sentido me parece importantísimo, creo que problablemente el marisqueo uno de los pocos oficios tradicionales que han hecho las mujeres que todavía permanece."

Participant 14 - Researcher

Respondents spoke about the social role played by their grandmothers until the early twentieth century, when shellfishery was still a relevant subsistence activity that prevented extreme poverty in the coastal zone. More recently, this activity has become, in the last three decades, an important brand that represents part of the cultural image of Galicia, which is attractive both to tourism and to haute cuisine.

Finally, two important aspects of territorial identity were observed among shellfisherwomen. The first involves the symbolism of coastal territory, which reveals the intangible value of the environment for them. In addition to their natural-biological perspective on the environment, they associate the environment with learning and knowledge, confrontation and adversity, affectivity, and also psychological and spiritual relaxation.

The second aspect highlights an idiosyncrasy of shellfishery: the intrinsic link with territory and the dependency on it. Unlike other fishery categories, shellfishery is limited to a specific area of the coast, both by traditional inheritance practices and by the regulation of resource exploitation. Since the Fishing Law Number 6/1993 of 11 May, each shellfisherwomen group was allowed to work in a given territory with a limited number of people in each shellfish area. The decision of who acts in each territory has been established by the historic occupation of the territory, and is mandatorily by the regulation of the local government. Therefore, if a specific zone is damaged, shellfisherwomen cannot move to another one, making them extremely dependent on their territory.

Frente a otras actividades como la pesca, donde esa facilidad por el desplazamiento, de buscar nuevos caladeros, de a veces realizar desplazamiento y capturas desde la esquina en el mundo, de realizar medios muchos más masivos e industriales, de la utilización de los barcos, de las grandes neveras que te permiten automáticamente congerlarlo para luego venderlo, etc, en este caso es una actividad que tiene la importancia social pero también ambiental. El marisqueo es uno de los sectores que más directamente le afecta cualquier tipo de transformación, de deterioro de los ecosistemas litorales, o de los ecosistemas costeros, es de los que digamos le repercute más directamente, desde el punto de vista económico, realmente puede repercutir a otros sectores como el turismo, pero es que en ese caso supone la directa desaparición de esa actividad. Entonces

el marisqueo como parte de esa pesca artesanal es una pesca muy sensible a los impactos ambientales.

Participant 12 - NGO agent

This root cause reveals subjective aspects of territory. In this scenario, territory has the status of an irreplaceable element due to the attachment and the sense of belonging. In addition to questions about territorial regulation, subjective elements should be considered as relevant factors in displacing women affected by disaster, especially in the shellfisherwomen's case. This analysis, poorly documented in the disaster literature, deserves more attention (Cupples 2007; Eklund and Telier 2012).

II. Gender roles of shellfisherwomen in the Galician coastal zone

Prior to the Prestige disaster in 2002, shellfisherwomen were characterized in very specific ways that had varied little over the years. The predominant profile identified for this research and confirmed by secondary data (Marugán-Pintos 2004) is of middle-aged women around 50 years old, married and with 2 to 4 children. As mentioned above, they are often the primary caregivers of children and of older members of the family. Most of them were born and live in the same coastal village. Their level of education is low and all their training or qualifications are in the fishing sector. On average they have worked as shellfisherwomen for 20 years, earn €9,600 a year, and are not the main breadwinners of the family.

This overview can be explained by the place of women in Galician coastal society, which is clearly determined by the roles assigned to them within a socio-cultural paradigm. Enarson (1998) has identified three levels of labor done by women in their daily lives: reproductive, productive and community. She verified the implication of these work categories in the women's post-disaster capacity for resilience, considering both their potential and their limitations. Thus, the shellfisherwomen's degree of vulnerability in the face of resilient actions could be detected through the analysis of their roles played before the Prestige accident.

In this context, the sexual division of labor makes women predominantly responsible for reproductive work. Basically, this means organizing and maintaining the home and caring for the family. With respect to the latter, not only are married women with children committed to caring for their families, but also single women must care for their elderly parents, grandparents, or even elderly aunts and uncles. This is the basic social organization in this zone, reflecting what is expected of women.

"Y en esta zona, que es una zona de costa pero rural, generalmente una mujer que trabaja en el percebe, trabaja en el percebe, atiende su casa. Galicia, las parroquias pequenitas, los abuelos, los padres, siguen viviendo en casa, entonces

atiendes los niños, atiendes los abuelos, atiendes los padres. Llevas tu casa, haces la compra, y normalmente trabajas también un poquito en el campo, tienes una huerta, tienes tus lechugas, tus tomates, tus batatas, sueles tener un cerdo, pollos, quiero decir, todas estas cosas las haces."
Participant 1 - Shellfisherwomen

The data about caring for older relatives stood out especially when compared with the rate of aging in Galicia. According to the Galician Institute of Statistics (IGE), in 2002, the year of the disaster, 21% of the Galician population was 65 years old or older, which makes Galicia one of the autonomous communities in Spain with the oldest residents. This aggravates the caregiving role assigned to women in this area.

Productive work revealed two main problems: shellfishery is divided into two categories with unequal working conditions. Shellfishery is practiced both on foot and from vessels, and access to vessels sets some workers apart. The first category consists mostly of women, the second mostly men. According to respondents, men traditionally inherited vessels, a custom that has been changing gradually in recent decades. Moreover, shellfishery on foot is conditioned by tidal movements, reflected in the number of working days per month. Consequently, shellfishery on foot remuneration is the lowest of all the fishery categories, which is why shellfisherwomen consider their economic contribution to their families to be small.

In addition, respondents reported other conditions contributing to women's inequality, such as forbidden access to specific fishing zones, smaller catch quotas within the same shellfishing category, and restricted participation in the sales process.

"Eh, date cuenta que incluso en el trabajo, en las distintas zonas de percebe habían piedras que hasta hacía pocos años eran de hombres. Y que una mujer llegase hasta ahí era casi una ofensa, era casi <<no tienes derecho de estar ahí>>. Eh, a la hora de la subasta los percebes se ponían en una mesa, primero lo de los hombres, y luego lo de las mujeres. Y luego, <<las piedras vamos a trabajarlas cada uno que llegue adonde pueda, según sus cualidades, cada uno que valore hasta dónde se quiere mojar y el percebe se va a subastar en conjunto, porque todos pagamos los mismos impuestos, básicamente, porque todos disponemos del mismo permiso de explotación, y porque, majo, cuando hay temporal hay temporal para todos y cuando sale el sol sale el sol para todos>> [risos]."
Participant 1 - Shellfisherwomen

Shellfishery has also suffered from administrative inequality, since it was not a government priority. On one hand, public administrations continued to regulate

shellfishery through fishermen's associations until the 1970s (Marugán-Pintos 2004). On the other, the profession was only recently incorporated into the National Classification of Occupations (in 2011). This marginal condition of shellfishery was reflected in the comments of interviewees. Most of them related their low recognition and relative exclusion from the structures of power, both in society, the fishing community, and the government.

The barriers inherent in productive work explain why the main goal of women in this zone is to get a job that reconciles work with family care. They seek flexible working hours, and shellfishery is one of the few options available. Therefore, being a shellfisherwoman is not just a choice, it's an occupation reserved for women by assigned gender roles.

> *"Pues, bien, bien. Es un trabajo que te ayuda mucho, (…) O sea, es muy compatible una cosa con la otra, y la cuestión es que luego tienes la tarde libre, porque te da tiempo, si no es en una hora haces en una otra. Bien, es muy compatible, muy... en ese caso sí porque si es temprano la marea, estos días hemos salido de casa a las seis de la mañana, pues normalmente yo tengo a mi tío en casa, que es una persona mayor de ochenta y cinco años, es un abuelo, claro. Pues, que se queda en cama, tal, después cuando llego yo en casa, hago las cosas de casa, echo los animales, y vas yendo cada día tres cuartos de hora más tarde, no? Siempre puedes retrasar un poquito las cosas, si preparar la comida, o tiene que ser muy rápida para hacerla en un día o si no haces un día antes, una carne asada... dejas algo ya preparado."*
>
> Participant 5 - Shellfisherwomen

This context of inequality persisted until a few years before the Prestige disaster in 2002. Change occurred when shellfisherwomen, supported in a few cases by the president of a fishermen's association or the government, accelerated the progress that led to greater equality. Interviewees also described how women confronted machismo inside the fishing sector and were exposed to several serious conflict situations and great resistance to change from men. Machismo is a term originated in Latin studies that specify contexts in which there are immutable and backward gender relations. However this concept has been largely applied in other cultural contexts that present analogous situations (Cranford 2007).

Machismo also strongly affected women who broke with this sexist paradigm by taking on community work, like management tasks in the fishermen's association, positions historically occupied by men. A few years before the Prestige disaster, shellfisherwomen did not have direct representation in public meetings and were excluded from decision-making processes. Fishermen were their representatives in public spheres, even though they were unfamiliar with the reality and demands of

shellfishery. Shellfisherwomen who challenged this paradigm faced threats and resistance from fishermen. Also, in this case, few leaders had support, mostly from other shellfisherwomen and, exceptionally, from the president of fishermen's association, the government and fishermen.

> *"Entonces para, nosotras, yo, para entrar en la cofradía, por aquello entonces tuve que pagar 3000 pesetas! Para ser socia! Porque en ese momento el patrón que había pues ponía estas normas. Porqué ponía estas normas con un precio tan alto? Para que ninguna mujer fuéramos socias de la cofradía. Pero un grupo importante, pues decidimos gastar las 3000 pesetas para seremos socias de la cofradía. Empezamos con eso. Después pasaron unos años, cambiamos de patrón, que era un, que se jubiló ahora, entonces fue una persona que siempre nos apoyó a las mujeres en todo, nos llevó al camino de nos organizarnos, vender bien, en todo, nos apoyó siempre en todo. En ese momento nos metieron en la cofradía y él dijo "no, no, aquí en la cofradía cuando son las elecciones, y tal, que son legislaturas de cuatro años, y tal, vamos a meter a todos los sectores: armadores, de bajura, y tal, y la parte social, trabajadores, pero al mismo tiempo también a las mariscadoras". Entonces en su lista pues ya metió, fuimos gente del marisqueo para la lista de la agrupación para la directiva de la cofradía, entonces ya fue mitad armadores hombres y mitad mujeres mariscadoras, hasta el momento."*
>
> Participant 7 - Shellfisherwomen

Moreover, there were no clear rules for shellfishery before women were represented in the Fishermen's Guild from the 1990s. The work environment was strongly characterized by competitiveness over catch quotas among shellfisherwomen from different territories as well within the same group. For some time, a small number of shellfisherwomen were hostile towards their partners and new female leaders. The shellfisherwomen had to make a great effort to overcome their own vision of themselves and to evolve from rivals to partners. This cultural change was slow paced, which explains why some women leaders felt vulnerable before their own colleagues.

In all the localities studied, the introduction of equity in the management of fishermen's organizations was very slow and had not been consolidated when the Prestige disaster occurred in 2002. The combination of these inequality factors has had a dramatic impact on the invisibility of shellfisherwomen confronting a disaster event, especially in terms of their specific needs, but also regarding their capacity to participate in recovery. This perspective of women's invisibility in disaster has been well diagnosed in the literature (Enarson 1998; Fordham 1998; Fothergill 1999; Reyes and Lu 2016; Scharffscher 2011; Seager 2006). However, the origin of women's

invisibility in disaster contexts has been poorly documented, which is why the results of this study could make an important contribution to this field.

III. Predatory model of fisheries resource management

Overexploitation of fishery resources has greatly weakened the marine environment, and has directly affected shellfishery. Before the Prestige disaster in 2002, the fishing sector had developed an exploitation model that embodied small-scale fishing, including shellfishery, but ignored the carrying capacity of the marine ecosystem. Despite the sea-generated resources, the marine environment was fragile, a scenario described by the interviewees as the tragedy of the commons (Hardin 1968).

> *"Hum... te digo, aquí, aquí te cuento, hicimos la agrupación de mariscadoras en el noventa y... en el noventa y siete. Y de ahí, de no temernos nada, empezamos a... ahí tiramos mucho las mujeres para delante. Eh, empezamos a juntarnos... teníamos mucho furtivismo, porque claro, la gente cuando iba a coger no había un control por nuestra parte, también el sector cogía sin control, tampoco las tallas se respetaba mucho, es decir, había un descontrol. Como yo les decía <<somos furtivos todos>>, cuando no hay un control para nadie somos todos furtivos, entonces tenemos todos que arrimar el hombro. Nosotros tenemos que aprender a hacer las cosas bien, y exigir a los demás que también las haga bien."*
> Participant 11 - Shellfisherwomen

Lack of controlled catches and the absence of management zones were mentioned by respondents as irresponsible practices not monitored by fishermen's associations or controlled by public administrations. Interviewees also reported that shellfishing banks were usually plundered by fishermen, the temporarily unemployed (mainly men) and even shellfisherwomen from other zones. This led to low prices for shellfish and low remunerations for shellfisherwomen, benefiting only the middlemen.

The change toward a sustainable shellfishing model was stagnant for two main reasons: the predatory mentality of fishermen (managers or not), who sat exclusively on the boards of directors of the fishermen's associations, and the lack of shellfisherwomen's autonomy over their fishing category. This suggests that excluding women from making decisions undermines marine balance, directly exposing resources to an oil spill disaster. The literature has shown the benefits of including women in marine management (Bennett 2005; Davis and Gerrard 2000; Di Ciommo and Schiavetti 2012; Weeratunge, Snyder and Sze 2010), due to their conservationist views.

6.1.5.2 Pressures on the Galician coastal zone

IV. High incidence of maritime transport in the zone

Interviewees indicated maritime transport as a constant pressure on the zone. The Galician coast is one of the corridors most transited by cargo vessels in the world, including ships with hazardous cargoes. In addition, this zone is exposed to extreme weather conditions from the Atlantic Ocean, especially on the *Costa da Morte* (Coast of Death). Frequent storms, strong ocean currents, a rugged seabed, and strong wind gusts were the main natural events described by respondents.

The respondents' observations combined with data from secondary sources drew even more attention to this issue (Boada, Feijoo and Rieradevall 2005; Larruga, Pérez and García 2005). Before the Prestige in 2002, the status of maritime transport was critical because non-compliance with legal requirements for safety was a widely extended practice among cargo ships. These irregularities include using flags of convenience, subcontracting transport companies, and using excessively old tankers or single-hulled ships to move hazardous cargo. The combination of these elements makes this coast one of the most important shipwreck hot spots in the world.

V. History of shipwrecks with hazardous cargo

The Galician coastal zone had been affected by important shipwrecks before the Prestige disaster, especially of oil tankers and cargo vessels with toxic chemical substances (Table 4).

Table 4: List of recent shipwrecks with hazardous cargo on the Galicia coast before the Prestige disaster

SHIP	ACCIDENT DATE	TOXIC MATERIAL	QUANTITY SPILLED
Polycommander	1970	Crude oil	15,000 metric tons
Erkowit	1970	Insectide	286 metric tons
Urquiola	1976	Crude oil	101,000 metric tons
Andros Patria	1978	Heavy crude oil	60,000 metric tons
Cason	1987	Toxic, inflammable and corrosive chemicals	1,100 metric tons
Aegean Sea	1987	Light crude oil	67,000 metric tons

Source: Own elaboration based on the Centre of Documentation, Research and Experimentation on Accidental Water Pollution database (2015)

In the Polycommander case, a highly harmful dispersant was used to stem the oil spilled. The Erkowit accident led to the spill of a noxious pesticide called Dieldrin, which has been banned in almost the entire world. But both accidents have a common feature: they happened during the dictatorship in Spain. Official information was denied or concealed by the government and few studies were conducted in the

impacted areas (Cedre 2015; Laxe-González 2003; Roland 2013; Sotelo 2003; Viñas 2009).

In the democratic period after the dictatorship four accidents occurred before the Prestige disaster: the Urquiola, the Andros Patria, the Casón, and the Aegean Sea. Although access to information had not been satisfactory and explanations came mainly from the press, more information was available about these disasters than about those that occurred during the dictatorship.

With respect to the toxicity of these accidents, a large amount of dispersants was used after the Urquiola accident to restrain the oil spill. After this disaster, the affected flora and fauna took several years to recover. The Andros Patria disaster was also characterized by the large-scale use of dispersants in response to the oil spill. In the Casón case, the focus was on the high toxicity of the cargo. Finally, in the Aegean Sea catastrophe, a high level of toxicity was recorded because of the fuel type (Cedre 2015). Some interviewees reported that it is still possible to find vestiges of the Aegean Sea spill in rocky zones.

> *"Hubiera sí, pero yo ya de ese no me acuerdo. Aun todavía hay manchas de ese navío Pero no te puedo decir, ya de ese no me acuerdo. Pero sí que hubiera, dejara todas las piedras... aun se ve por muchos sitios. Nosotros bajamos mucho una escalera que hay debajo de un camping, 'el molino' le llaman, y todavía hay, de aquella eh, no fue del Prestige fue del de aquella! Dejó muchísimo, sí."*
>
> Participant 6 - Shellfisherwomen

This vulnerability factor revealed an unknown dimension of disasters prior to the Prestige and its effects, which have not yet been documented. Some studies about the Prestige cite previous accidents in the area, but missing information could have provided a deeper analysis of the long-term impacts of these accidents on the Galician coast. Additionally, the testimonies that mention vestiges of oil in some zones nowadays suggest that the cleaning activities failed or were not effective. All these factors also evidence how difficult it is to measure the Prestige impacts, due to the impossibility of drawing a clear line between the before and the after of the disaster.

> *"Porque siempre está la pregunta, bueno han pasado diez años, qué impacto ha tenido el Prestige? Claro, a mi siempre me ha parecido que es muy difícil responder a eso por dos cosas, una por lo que te decía antes, aquí tenemos una gran marea negra a cada diez años prácticamente, entonces en qué medida lo que estamos viendo es el efecto de ésta marea negra, lo que queda de la anterior... Tuvimos el Urquiona en el 78, el Mar Egeo en el 92, el Prestige en el 2002 y ya veremos si no estamos, o sea, estadísticamente estamos a punto de tener otra no, si lo hacemos caso."*

Participant 12 - NGO agent

Also relevant is the weak collective memory of previous accidents. As a whole, interviewees had difficulty remembering, directly or indirectly (through what their parents or grandparents had told them), impressions of old disasters. The fieldwork revealed great efforts to rescue these memories, providing evidence that the interviewees had not reflected on the connection of the history of these disasters and their vulnerability to oil spill events, which can be explained by several factors.

First, the stakeholders did not have transparent access to information provided by the government on the risks of these accidents. Moreover, shellfishing was not considered an official profession in the period in which these accidents occurred, which certainly had implications for the awarding of damages because there were no rights to be infringed upon. Finally, the shellfisherwomen felt powerless in the face of these catastrophes because they did not have their own organization to represent their concerns.

VI. Permanent pollution sources

The persistent presence of several sources of pollutants was detected along the Galician coast. Interviewees often reported pollution incidents from ship bilge cleaning, water treatment plants, drainage systems, industrial waste, and aquaculture.

> *"Después se nos acotó mucho la zona también, por culpa de... de... de las mareas rojas... o sea de... de las depuradoras, de los desagües, de todo eso, influye mucho también."*
>
> Participant 4 – shellfisherwomen

According to them, red tides along the coast were very common occurrences since before 2002. The respondents agreed about the hidden dangers of these pollution sources, which had not been reported in previous studies of the Prestige disaster. First, they occur in a permanent way. Second, they are "silent" and do not affect citizens or mobilize the media. Third, they appear to have cumulative effects. Finally, the level of impunity is high, even when the fishing sector demands compliance with environmental laws.

Shellfisherwomen also claimed that disasters were used to create "smoke screens" to mask the everyday sources of pollution that have affected this area. Although this would not have decreased the drastic effects caused by the Prestige, it draws attention to the serious risk situation of marine ecosystems in the Galician coastal zone.

VII. Lack of disaster response training

None of the interviewees in the studied zones reported any training experience or access to resources for disaster response before the Prestige catastrophe, independently of the degree of exposure or any previous experience with spills in their zone. Nor was any reference to training found in secondary sources. This lack of preparedness was identified in several spheres.

> *"Yo digo siempre, vamos a ver, nosotros sabemos que somos vulnerables, todos, los políticos que estaban en el parlamento gallego sabían que no tenemos ningún barco anticontaminación, entonces sabemos que si hay un caso de estos hay que llamar a otros sitios y cogerlo de donde haya, y esperar lo que haya que esperar, es como si yo no tengo calefacción y viene un invierno de estos... lo siento, no puedo dar a la llave, porque no la tengo. Ahora, si la tengo y no me funciona, no hice una gestión bien de ella, pero si no la tengo, si no teníamos nada, pues, si no tenemos nada de dónde sacamos?"*
>
> Participant 11 -Shellfisherwomen

First, no government agencies, including the coastal protection, environmental conservation, and civil defense sectors, had promoted any kind of training, provided material for oil containment, or even informed the coastal population about the risk of an oil spill. Second, the different oil companies that have used the Galician maritime corridor to transport hazardous cargoes have no record of training or preventive measures against catastrophe. Finally, the topic of disaster preparedness was not on the agenda of the fishermen's association. The need to train local populations has been reported in the literature as an efficient way to improve disaster response (Asgary and Halim 2011; Cohen 1986; Viladrich-Grau 2003). This deficiency in disaster preparedness demonstrates coastal protection negligence.

6.1.5.3 Unsafe conditions of shellfisherwomen facing oil spill events

VIII. Threat to the artisanal shellfishing model

The Galician model of shellfishing has developed in a peculiar way. Shellfish extraction in the estuary is artisanal, using low-impact technology with simple tools and manual labor. This traditional fishing technique has been maintained for centuries by shellfisherwomen. They have a central role as guardians of this conservative extraction model.

> *"Pero si por ejemplo en algún momento la transmisión del derecho de acceso de un recurso puede ser comprado imagínate, por una multinacional, que compra los derechos de todas las mariscadoras de Galicia entonces, esa persona puede utilizar un sistema de recolección del marisqueo, puede contratar a dos o tres personas y con un sistema mucho más [busca la palabra] agresivo o productivo, podría capturar en menos tiempo digamos más volumen de producción, pero que mientras los derechos sean individuales, sean transferibles a través de una serie*

de criterios de asignación de derechos, que estén basados en criterios sociales, etc."
Participant 13 - Researcher

Some interviewees highlighted the particular management logic of the shellfisherwomen, in which they take a systemic view of resource management. From this perspective, shellfisherwomen understand that the environmental balance is relevant to two systems: the family system (fishing is preserved because it is the main livelihood of most families) and the natural system (the notion that the species they catch are part of a whole system). This management logic is long-term, focused on the collective, and based on more than economic profit.

The artisanal technique is important because it represents a counterpoint to mechanical shellfishing techniques, such as dredging, trawl fishing, and other technologies, which have had a high environmental impact on the territory. With respect to load capacity, the Galician artisanal shellfishery model has less impact on the marine environment than other exploitation techniques. The analysis of women as relevant agents in resource management is widely supported in the literature (Agarwal 2010; Jackson 1998; McCusker and Oberhauser 2006; Nation 2010; Rocheleau and Edmunds 1997), although it has yet to be reported how this contributes to protecting the environment before an oil spill occurs.

IX. Local production chain dependency on shellfishing
According to a report of the Council of the European Commission (1999), before the Prestige disaster shellfishery was already a strategic and competitive activity of the Galician economy, providing specialized marine resources to national and international markets. According to Council of the European Commission data (1999), shellfishery was responsible for an industrial sector related to shellfish products, promoting a wide range of activities. Generating a local production chain is an unusual advantage rarely found in others activities in the zone and demonstrates the importance of shellfishery. Respondents described a production chain that has operated since before the Prestige disaster, wich includes seafood wastewater treatment, the seafood industry, local markets, ice factories, and the catering industry.

"Cómo me va a parecer bien que venga una hecatombe como la del Egeo o la del Prestige! Que no solamente va afectar a las mariscadoras, afecta a todo el sector que trabaja en el mar. Y no solamente nos afecta a nosotros: a depuradores, a compradores... ahí hay una cadena humana que vive del mar, y cuando rompe una cadena el eslavon se pierde, o no es verdad? Yo creo que es así, yo pienso que es así. Nosotros formamos un engranaje en esta cadenita, pero si la nuestra rompe... pues la de al lado también se va oxidando y con el tiempo va a romper y

esta va seguir, va a seguir. Somos el eslavón de una cadena. O al menos yo lo veo así."
Participant 10 - Shellfisherwomen

A qualitative feature of this chain also stands out: women occupy most of the jobs resulting from it, mainly in trade and industry. In this sense, the economy generated by women is more important than the statistics reveal. This invisible economy is well analyzed by Garcia-Negro and Zotes-Tarrio (2006) in their studies about women's work in the Galician fishing sector.

Oil spill hazards bring instability to the local economy, affecting several occupations maintained by shellfishery. Measuring the total number of affected people would require consideration of a wide range of situations, not only those of people affected directly. A clear example is shellfisherwomen who also work in local markets. The main issue here is that the consequences of an oil disaster would not affect coastal communities in the same way. This unsafe condition influences women more specifically, since results reported that this is a feminized economy. The lack of job options and other social possibilities expose women in these coastal localities to a high degree of vulnerability, which is closely connected to their gender role limitations.

X. Lack of risk perception among shellfisherwomen
Shellfisherwomen did not perceive the risk of new accidents happening before the Prestige disaster. Prevalent was the belief that oil spills were a problem that had been overcome in developed countries, where comprehensive protection measures had been put in place. The infallibility of technology was another common belief, characterized by the idea that technology is safe, effective and trustworthy. The oil industry, highly technical in nature, was incorrectly understood to be in control of the situation.

"Hoy en día yo no me imaginaba que pudiese ocurrir una catástrofe de este tipo, creía, creía, vamos en cuanto a esto vivía, vamos, es que oía hablar de los hundimientos, de las catástrofes, pero, pero, claro, como algo que ocurrió hace muchísimos años yo… A ver, yo creí que, yo que sé, que hoy en día, pues estamos, hay demasiados adelantos, los barcos van demasiado equipados, no es que vayan demasiados equipados, quiero decir que están muy equipados, parece que tienen muchísimos medios, no, para evitar... Saben cuando va a haber temporales, si tienen que fondear, los barcos están construidos de otra manera, llevan un montón de equipos de seguridad, de chivatos, de pitos, y yo que sé, pensaba que no... No, no, yo creía que no. Y se ocurría, yo, por lo que escuchaba en la tele, en sitios muy lejanos, y en países que no estaban tan adelantados como nosotros, yo que sé, no te puedo decir. No me imaginaba semejante catástrofe."

Participant 2 – Shellfisherwomen

The effects of these beliefs vary according to the zone. In zones that had never witnessed an oil spill before the Prestige, the prevalent belief was that these zones were untouchable. In contrast, interviewees in zones that had been affected by an oil spill thought the previous accident had been fortuitous. The idea of misfortune or causality is generalized in affected areas, with little or no consideration for the risk scenario they face.

Other factors contributed to this lack of risk perception. Shellfisherwomen were excluded from the decision-making process, hampering their access to information about the conservation of the coastal zone. Moreover, as a preventive policy for oil disasters did not exist, neither did a risk culture, giving the impression that the problem did not exist. The combination of these elements suggests a lack of suitable conditions for shellfisherwomen to realize that their zones were at risk.

Due to the complexity of gender and risk issues, this result demonstrates that risk perception depends more on multi-dimensional factors than on women's biological features, as defended by essentialist scholars (Eisler, Eisler and Yoshida 2003; Kimura and Katano 2014; Morioka 2014).

XI. Absence of an emergency response plan, integrating stakeholders
No records of meetings with government officials, reports or information about public participation at the moment of the Prestige disaster were found in the localities studied or in any secondary sources. Interviewees revealed that stakeholders were not included as active agents in disaster response. In addition, they didn't know any tools or channels to contribute officially with their local knowledge about the zone.

This response category not only indicates a lack of government protection, but also reveals a scenario favorable to a top-down disaster response based on a military structure, excluding stakeholders from participating in the recovery process. Local communities can offer valuable information about the affected zone in support of decisions to prioritize environmental and social recovery actions. In this context, some scholars have shown that women can be catalysts of change to improve disaster responses, due to their capacity to offer material and psychological care to their families, their ability to create livelihood alternatives, and their promotion of community measures to overcome crisis through a social support network (Childs 2006; Dhungel and Ojha 2012; Edgerton-Tarpley 2004; Fordham 1998; Rocheleau and Edmunds 1997; Scharffscher 2011).

6.1.6 Conclusion

This work employed a multi-factorial diagnosis to identify the progression in the vulnerability of Galician shellfisherwomen in the period previous to the Prestige disaster. It fills several gaps about the pre-Prestige scenario, and adds original information about gender and vulnerability in a technological disaster context, specifically an oil spill.

Results of gender analysis reveal that the root causes of shellfisherwomen's vulnerability was related to the territorial link and gender roles; and that the Galician coastal zone was extremely exposed to a catastrophe due to pressures provoked by prior oil contamination and other associated factors. Finally, the unsafe conditions were associated with the peculiar way they carry out their shellfishing activity and with failures in disaster preparedness and response.

Thus, three main conclusions contextualize the shellfisherwomen's vulnerability in the pre-Prestige scenario, and point out possible recommendations to mitigate these vulnerability factors.

First, compared to other categories of fishery professionals, shellfisherwomen were in an evidently marginal situation, putting them at a disadvantage when disaster occurred. Changing this scenario would require further consideration of some elements.

When a disaster occurs in their territory, for both customary and administrative reasons, shellfisherwomen have limited options for displacement to other shellfishery zones. Moreover, the subjective aspects of their territorial identity should also be contemplated to minimize mental health impacts. Therefore, a reasonable measure to safeguard the shellfishery territory and, consequently, avoid important impacts for shellfisherwomen would be to expand the Spanish system of Marine Fishery Reserves, such as the successful *Ría de Cedeira* and *Os Miñarzos* reserves, both in Galicia. This type of protected area would allow the direct participation of shellfisherwomen and the use of instruments, such as financial aid, to compensate future impacts on shellfishing.

Another important element is gender inequality. Reducing it requires some understanding of how the roles assigned to women in the local context interfere with their autonomy and capacity to participate in decision-making processes. To reduce the impact of oil spills and make visible the needs and abilities of shellfisherwomen in the preparedness, response and recovery stages, shellfisherwomen representation must be mandatory, in compliance with the Spanish Plan for Gender Equality in the Fishery and Aquaculture Sector (2015-2020). This issue should be placed on the

agenda of the agrupaciones to promote an awareness-raising campaign within the group itself, and thus extend the representation of shellfisherwomen in the decision-making process at local and national level.

Second, the combination of pollution, especially an oil spill, with coastal protection negligence resulted in a fragile zone, which compromised the recovery capacity of the Galician coast and increased shellfisherwomen's exposure to the hazard.

This vulnerability factor can be mitigated through three continuous and prioritized marine conservancy approaches: governmental commitment to guarantee marine safety legislation; participative struggle against marine contamination; and improved disaster preparedness, through local training and resources providing. These measures can contribute to increase the resilience of the environmental and social systems, thereby diminishing the risks facing them.

Third, the oil spill disaster represented a threat to the entire cultural, environmental and economic model maintained by shellfisherwomen and mainly benefited women, who had few opportunities in that zone. To guarantee the integrity of this model, two recommendations are proposed.

On one hand, the transformation of shellfisherwomen's artisanal techniques into a competitive advantage in the fishing market gives value to this feminized productive chain. One possibility is the creation of a certification, encompassing environmental conservancy, fair trade, and gender equality, and thus inviting consumers to purchase shellfish with added value. At the same time that it strengthens the sector, this measure encourages shellfisherwomen to maintain artisanal techniques.

On the other hand, the need to create a culture of risk perception of oil pollution is urgent, and channels of participation should be opened to promote the engagement of local people in an emergency plan, while also respecting principles of gender equality. Despite the Spanish Plan for Gender Equality in the Fishery and Aquaculture Sector (2015-2020), cultural barriers continue to hinder women’s participation in public spheres.

Therefore, the proposal is a bottom-up approach to make visible shellfisherwomen’s vulnerability. First, risk perception must be included in the internal agenda of shellfisherwomen, at the local and national levels, which could be supported by the Spanish Network of Women in the Fishing Sector. The second stage is to involve Fishermen’s Guilds in this concern and thus to pressure Spanish institutions to build a

risk agenda that will benefit coastal protection and, consequently, the shellfishing zones.

This vulnerability analysis reveals not only the weaknesses of shellfisherwomen; it also shows their strengths, which, if valued, could have positive effects on an oil disaster response. These strengths are related to their special characteristics in roles such as environmental managers, investors in the local economy, conservationists of shellfishing culture, and social activists. Future studies should delve deeper into the lessons of the Prestige, noting the benefit of gender-equitable participation in the current panorama of oil disaster prevention in Spain.

To conclude, in vulnerability studies, gender is usually reduced to an isolated, anecdotal, and irrelevant variable. Without gender analysis, the representation of the disaster tends to be partial, excluding a significant part of the affected population: women. The assumption that vulnerability is unequal in the social-environmental system must be reinforced to assess this issue further. In particular, it should be applied in technological disasters studies, due to drastic damages such as toxic contamination. Integrating a gender perspective improves technological disaster preparedness and response through actions that generally benefit people at risk.

6.2 The Prestige oil spill's gender impact assessment: exposure and sensitivities of Galician shellfisherwomen

Figure 14: The percebeira extracts the percebe on the rocks with a rudimentary tool

6.2.1 Abstract

Oil spills represent a pollution stress factor, usually with a disaster magnitude, that places the marine environment and the fisheries communities at risk. Based on a social-gender impact assessment, this study analyzes the damages caused by the Prestige disaster, in Spain in 2002, to Galician shellfisherwomen. The main results detected that the lack of disaster preparedness, the features of the spill, and disregard for fishing community knowledge were failures that increased the exposure of shellfishery zones. With regard to shellfisherwomen's sensitivities, results show that immaterial damages and disproportionate treatment and assistance in affected zones were classified as short and middle-term impacts. In addition, changes in marine resources availability, interference of other sources of marine pollution, and conditions adverse to the establishment of a risk culture were identified as long-term impacts. Approaching the assessment of an oil disaster from a gender perspective extends studies of oil spill impacts in marine environment to women’s groups, besides offering a more complete evaluation of damages to social groups, contributing thus to minimize future impacts.

6.2.2 Introduction

Oil spills are among the sources of coastal degradation with greatest impact on fisheries communities' sustainability. They do not represent the most frequent stress factor in the marine environment, but when they occur, they are usually catastrophic. Therefore, a black tide represents a great risk to the human-environmental system linked to the coastal zone (Álvarez and Loureiro 2013; Lin, Shih and Chiau 2013).

Nonetheless, an oil spill does not affect all social groups equally. In the case of women in fishery, unequal access to economic resources or their exclusion from decision-making processes are some of the factors that reinforce their exposure to the effects of black tides (Anugwom and Anugwom 2009; Fatusin, Afolabi and Adetula 2010). Therefore, the full impact of an oil spill can only be understood by considering the heterogeneity of each vulnerable group (Blaikie et al. 1994; Webler and Lord 2010). Feminist studies have contributed to this understanding by analyzing environmental degradation through a gender perspective (Boohene and Peprah 2011; Ginige, Amaratunga and Haigh 2009; Nowak 2008).

A great gap still exists in the scholarly literature about the impacts of an oil spill on women's groups. Studies are usually done in the governmental and non-governmental sectors, mostly focused on African countries (IA 2014; NAPE 2016). Another limitation found in the literature is the analysis of the kind of impact, which is normally focused on women's health problems in contaminated zones (Anugwom and Anugwom 2009; Fatusin, Afolabi and Adetula 2010). On the other hand, the impacts of oil spills on women who are involved in productive labor highly dependent on natural resources, such as women in fishery activities, are not well known. Thus, this paper includes a gender analysis of the impact of the Prestige oil spill disaster, in Spain in 2002, to Galician shellfisherwomen. Its results can contribute to improve oil disaster preparedness and management in coastal zones from a gender perspective.

6.2.2.1 The gender dimension of costal degradation

Artisanal fishery usually represents an important local economic activity and a distinctive cultural trait that contributes to the sustainability of coastal zones. Women have occupied several job positions in both subsistence and commercial fishery. Their productive activities cover a broad range mainly on-shore, like processing and marketing the catch or developing other skills, such as the repair and manufacture of fishery items. In a smaller proportion, they have occupied different activities as fisherwomen, like offshore fishing, aquaculture, shellfishing or collecting invertebrates (Bennett 2005; Hauzer, Dearden and Murray 2013b).

However, due to their gender condition, women in these communities are almost always limited to these specific activities. The world of fishing has been associated largely with men, prevailing the patriarchal model. In it, men represent the main workforce and are the breadwinners, while women's labor is relatively invisible and undervalued. This paradigm leaves women at the lowest level of privilege in the fishing work chain, with unequal conditions, facing prejudices, lack of opportunities, handicap to access material resources and less decision-making power, besides another factors depending on the specificities of each fisherwomen group (Weeratunge, Snyder and Sze 2010; Zhao et al. 2013).

These elements lead fisherwomen to a vulnerability situation in front of coastal degradation. They are often the most immediately affected by the impacts on the marine environment because their social, cultural and economical condition, what limit their capacity to avoid or recuperate from the damages (Hauzer, Dearden and Murray 2013b; Nowak 2008).

6.2.2.2 Social impact assessment of oil spill in coastal zones from a gender perspective

Research into the social impact assessment (SIA) of oil disasters has increased, especially evaluating damages to human groups with a high dependence on coastal resources (Cheong 2011; Gill, Picou and Ritchie 2012; Kim et al. 2014). Webler and Lord (2010) have proposed a specific investigative approach to evaluate the social dimension of an oil spill. In that framework, the authors provide a model that assesses the direct and indirect effects of an oil spill on people through the analysis of the changes in the social-ecological dynamic (Cheong 2011). In this model, two concepts are used to assess oil impacts on social groups: exposure and sensitivity.

Exposure is a stress factor's capacity to impact a social group. Associating the specificities of the group to the features of the stress factor are crucial to predicting their level of vulnerability to an oil spill, in addition to allowing get more precise data that help avoid and recover from damages. On the other hand, sensitivity is the degree of impact suffered by a social group after exposure to a stress factor. The impacts can cover different dimensions of sensitivities (social, economic, health, or any other applicable dimension). The more unique a group is, the greater is its sensitivity, due to its specific social structure and the handicaps it faces in diversifying its skills and way of life (Webler and Lord 2010). Thus, both concepts enable a gender-perspective approach, since each social group can be singly observed from its own features and environmental conditions.

The association between gender studies and SIA is still incipient, but it has contributed to a greater understanding of oil impacts (Anugwom and Anugwom 2009; Boohene

and Peprah 2011; Fatusin, Afolabi and Adetula 2014). The gender impact assessment (GIA) is a tool initially developed to reduce gender inequalities in public policies (EC 1998; EIGE 2016). Nonetheless, the GIA has several connecting points with the SIA, favoring identify the specifics oil impacts to women groups. This useful tool considers their particular features through a multi-factorial approach based on topics like participation, norms, values, rights and resource distribution. The GIA offers elements to comprehend the complexity of the research subject, and consequently add value to improve the marine sustainability.

6.2.2.3 Shellfisherwomen and the Prestige disaster

The oil tanker Prestige was wrecked near the Galician coast in November 2002, leaking approximately 60,000 metric tons of fuel. Many studies of this oil disaster were carried out, especially on its effect on the marine ecosystem and commercial fishes. These studies identified the consequences of the Prestige disaster on the marine ecosystem (Bernabeu et al. 2009; Marigómez et al. 2013); the impacts on fish and shellfish populations (Abad, Bellido and Punzón 2010; Izagirre et al. 2014); and the economic impacts (Álvarez and Loureiro 2013; García-Negro, Villasante, Carballo-Penela 2007).

However, there are still many gaps in our knowledge of the gender impacts on artisanal fishery, an important activity in the Galician coastal zone. Shellfisherwomen comprise a significant collective in this region (Garcia-Negro and Zotes-Tarrio 2006). In the year previous to the disaster, the Galician Statistical Institute (2001) had registered 8,286 people working in shellfishery, of which 6,988 were women sharing vulnerability features to be considered in the analysis of the Prestige's oil spill impact.

The analysis done in Subchapter 6.1 showed the vulnerability features of Galician shellfisherwomen. One of them is the territorial identity of shellfisherwomen. They have shellfishing just in a very specific zone, determined by traditions and reguleted by public administration, what unable them to displace their activity to another area. Another feature that should be taken into account in the gender impact assessment is the gender roles of women in the Galician fishing communities. There was a clear sexual division of labor in which women could not choose or even change of fishing category without face great social-cultural barriers. Add to this, shellfisherwomen were the main family caregivers, what take them away from other fishing categories that could hamper this role. Finally, a third characteristic was the overexploitation of fishery resources, what greatly weakened the marine environment and affected the shellfishing sustainability.

Subchapter 6.1 also showed the relevance of these women in fishing and their high dependence on the environment. Although these elements configure a high degree of

vulnerability of this social group, the literature did not satisfactorily address this theme in previous studies. Therefore, this study analyzes the damages suffered by Galician shellfisherwomen after the Prestige disaster, with in-depth observations of the gender dimension, and extends studies of oil impacts in marine environment to women's groups.

6.2.3 Methods

This paper is based on qualitative research and uses primary and secondary data. The primary data consists of semi-structured interviews with three stakeholders groups. Secondary data consists of official information from government institutions, research center reports, press material and literature reviews to complement the primary data, when necessary. It was followed the methodology proposed by Webler and Lord (2010) to assess human impacts from oil spill events, however the gender perspective was inserted to better understand the Prestige impacts to the shellfisherwomen (EC 1998; EIGE 2016). In the first stage the study conducted a technical characterization of the Prestige oil spill to determine its main stress factors. Then the shellfisherwomen's experience and perception of the disaster were evaluated to identify their level of exposure and sensitivity.

6.2.3.1 Participants

Expert knowledge (Rossman and Rallis 2003) was used to select 15 participants. The first stakeholder group consisted of senior shellfisherwomen (n = 11) with leadership roles, in-depth knowledge of the zone, and experience with the Prestige disaster. The second group was formed by senior non-governmental agents (n = 02), with broad knowledge of the zone, in addition to field experience during the Prestige disaster. The last group comprised senior researchers (n = 02), with vast knowledge of the shellfishery universe, but from complementary perspectives.

6.2.3.2 Instruments

The instruments gathered data to typify the Prestige oil spill and the shellfisherwomen's experience with it. Field notes were taken to register all the observations *in situ* during the fieldwork. Moreover, semi-structured interview guides were adapted to the knowledge of each stakeholder group. To achieve the study's goal, the guides were designed based on the gender assessment methodology (EC 1998; EIGE 2016) associated with the social impact assessment (Webler and Lord 2010). The questions covered issues related with the Prestige's impact, as shown in Table 5.

Table 5: Main issues proposed in the interview guides on the effects of the Prestige disaster

THEMES EXPLORED IN THE INTERVIEW GUIDES
1. Shellfisherwomen's preparedness to face oil disasters
2. Disaster management consultations with shellfisherwomen
3. Main changes in the zone after the oil disaster
4. Consequences for shellfisherwomen after the spill
5. Social-environmental conditions of the zone in the last 10 years
6. The damages suffered by shellfisherwomen in the last 10 years

Source: Own elaboration based on EIGE (2016), EC (1998) and Webler and Lord (2010)

6.2.3.3 Procedures

Data collection and fieldwork

Data were collected from February 2013 to December 2014. Fieldwork was done in different stages in the Galician regions of the *Rías Altas* and the *Rías Baixas*. In the first stage, two field trips were made in the *Rías Baixas*, in April 2013 and June 2013. The fieldwork in the *Rías Altas* was carried out in July 2013. Researchers and fisheries institutions formed an information network to find the best locations. A total of six Galician shellfishing communities were visited, half of them in the *Rías Baixas* and half in the *Rías Altas*. The location names are hidden because a commitment was made to keep the interviews anonymous. The criteria to determine the eligibility of the zones were an area affected by the Prestige disaster and having a significant representation of shellfisherwomen.

The in-deep interviews, which lasted on average an hour, were recorded digitally. Ethical procedures were followed, and the interviewees gave their verbal consent to participate in the study in audio recordings. Interviews were conducted mostly in Spanish and, in a few cases, in Galician.

Data analysis

All the interviews were anonymized to guarantee the safety and freedom of expression of the interviewees. Then, the data were transcribed using a word processor, and translated into Spanish when necessary (Denzin and Lincoln 2003).

The second stage consisted of manual data codification combining coding methods (Saldaña 2009). First, transcripts data were read intensively to master their content. The First Cycle coding identified the main content in each paragraph through various coding methods: In vivo (codes removed from the literal discourse), Process (codes extracted from described actions) and Descriptive (codes that highlight the core of the fragment). The Second Cycle coding was designed to assemble the codes into smaller

thematic categories. The final categories were revised by two different researchers to guarantee coherence, and then data was interpreted through gender and social impact assessment theoretical frameworks.

6.2.4 Main results

6.2.4.1 Features of the stressors

The characterization of the Prestige disaster aims to dimension it, identify preliminary failures in its management, and predict possible damages to shellfishery. Table 6 presents the main stressors of this disaster identified by the interviewees and supported by secondary data: the planning to confront oil spill events and the features of the oil spill.

Table 6: Characteristics of the Prestige oil spill

STRESSORS	QUALITIES	INDICATORS
Planning to confront oil spill events	Disaster preparedness	Lack of response training
		Unavailability of resources *in situ* to respond
		Lack of an emergency response plan integrating local stakeholders
Oil spill	Quantity transported	77,000 metric tons
	Quantity spilled	64,000 metric tons
	Type of oil	Heavy fuel oil (nº 2, M100) High density and viscosity Low biodegradability and volatility Not dispersible chemically Considered insoluble Characteristic odor of petroleum
	Spatial extent	Around 2,980 km of coastline: Northern coast of Portugal Northern and northwestern coast of Spain Southern coast of France
	Type of area impacted	Shore and offshore Seawater Estuaries Sand beaches Rock shores
	Time of year	Autumn–winter

Meteo-oceanographic conditions	Strong surface winds
	River plumes
	Iberian poleward current
	Strong waves

Source: Own elaboration based on interviews and secondary data

The weakness in prevention actions is the main stressor. The Galician coastal zone has a long record of shipwrecks with hazardous cargos: Polycommander, 1970; Erkowit, 1970; Urquiola, 1976; Andros Patria, 1978; Casón, 1987; Aegean Sea, 1992 (Cedre 2015). Despite this context of successive accidents, interviewees reported that the huge lack of disaster preparedness was mainly evident in three areas: training, availability of resources, and participation in emergency response plan. As a consequence, sequential mistakes occurred in the response stage, especially because the governmental institutions overlooked the potential of local stakeholders to act as co-managers to contain the disaster. This lack of investment in disaster preparedness increased exposure to the Prestige oil spill.

> *"Porque claro, hubo grandes problemas, porque desde el principio cuando nos negaban la realidad que nosotros veíamos, porque nosotros sí que veíamos la realidad. Entonces, ellos venían y te decían cosas que tú veías que no era verdad, que la realidad nosotros la veíamos. Venían aquí y nos decían en la cara que no era tanta cosa. Pero cómo que no va a ser tanta cosa si estábamos vendo? Entonces, arreglaron muy pronto las ayudas, entonces la gente, lo que es la economía, en ese momento no porque empezaron a pagar muy pronto. A dar subvención, el sector de las ayudas todos los meses, eso agilizaron lo más rápido. Agilizaron primero eso que no el material, que les pedíamos y que lo necesitábamos con urgencia."*
>
> Participant 7 - Shellfisherwomen

Officially, the Prestige transported 77,000 metric tons of oil, of which 64,000 metric tons were spilled following the crash (Cedre 2015). However, it is difficult determine the total amount spilled, because residual oil remained inside the tank until almost two years after the crash. For example, a new black tide from the Prestige was identified in Brittany, France, in June 2003, although there is no official data about the amount of oil (La Voz de Galicia 2003). The residual oil, 13,000 metric tons, was removed from the tank only in October 2004. Afterward, approximately 1,500 tons of oil remained in the sealed tank, and received nutrients to accelerate its degradation (Sampedro 2005). However, the Spanish government acknowledged in 2007 that had not been possible to completely seal the tank (Vizoso 2007). The Prestige, therefore, was a long-term spill, with an imprecise quantity of leaked oil.

Furthermore, the type of fuel explains its behavior in seawater: it is resistant to degradation, has a low evaporation capacity (around 10%–15%) and does not solidify at low temperatures; on the contrary, it keeps flowing and tends to float on the surface. The oil quickly spread and then persisted in the marine environment (García-Negro et al. 2009). As a result, the entire Galician coastal zone was impacted, although in different ways and with different degrees of severity. Pelagic areas were less affected, not impacting heavily on deep-sea fishing (Wirtz et al. 2007). This suggests that small-scale inshore fishing, like shellfishery, was seriously damaged since it is developed primarily in estuaries, beaches and rock zones.

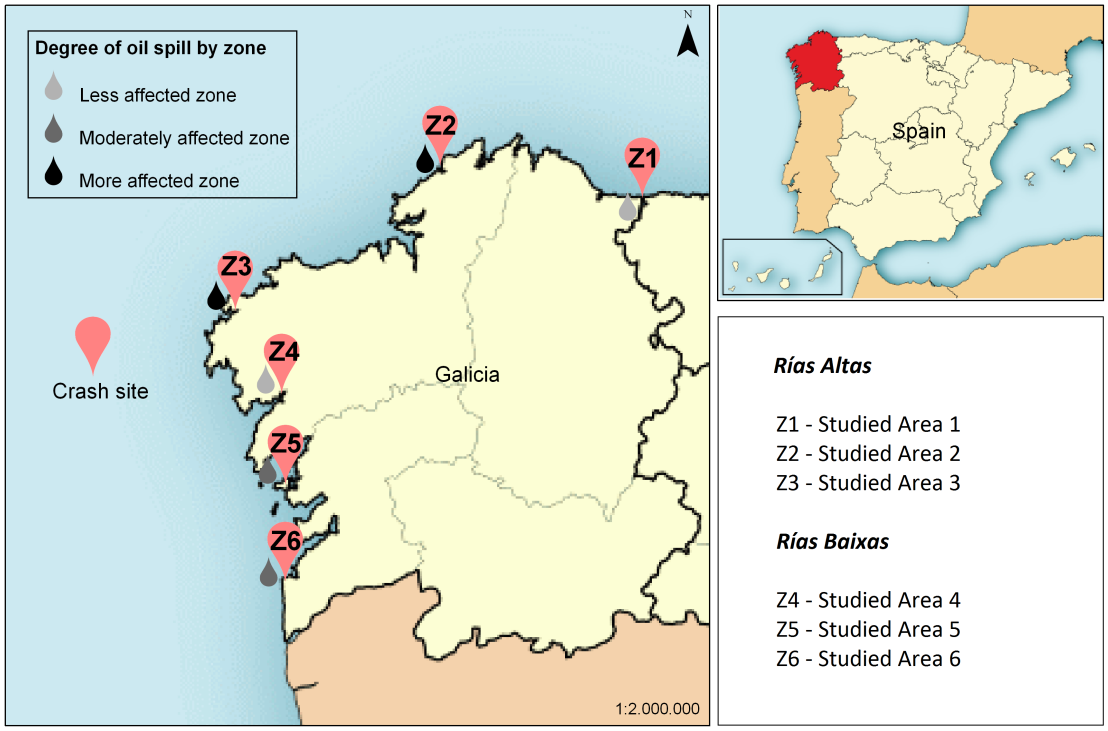
The last relevant factor is related to the meteo-oceanographic conditions (Ercilla et al. 2006; Ruiz-Villarreal et al. 2006). The Atlantic coast in Galicia is usually a zone of rough sea. The crash occurred in autumn-winter, the seasonal period that intensifies the navigation risk to the vessels. With the failures in disaster preparedness, meteo-oceanographic conditions worked as a catalytic element both to expand the affected zone and to hamper the response actions.

6.2.4.2 Exposure of studied zones to the stressor

The Galician coastal zone has 1498 km divided into two estuarine landscape groups. The *Rías Altas*, in the north, have a special presence of cliffs and narrow estuaries. In contrast, the *Rías Baixas*, in the south, have broader estuaries and a significant number of islands. This geographical difference is reflected in shellfishery, since the *Rías Baixas* have more favorable conditions for shellfish production. It is the most important area in this fishing category in Spain, with a greater concentration of shellfisherwomen and high quality shellfish.

The entire Galician coast was affected by the Prestige oil spill, respondents according to their marine environment knowledge had detected and described specific affections that allow us to distinguish three contamination levels, as shown in Figure 15. Less affected zones only registered the presence of tar balls on the seawater surface and on sand beaches (Figure 16). In moderately affected zones few beaches and rocks were damaged (Figure 17). Finally, the most affected zones had massive volumes of oil on beaches and in rocky zones (Figure 18).

Figure 15: Exposure of estudied zones to the Prestige oil spill according to respondents' evaluation



Source: Own elaboration based on interviews

Considering the location of the studied zones from to the crash site, the nearest zones were not necessarily the most affected, strengthening evidence of a meteo-oceanographic influence on the oil exposure. The evolution of the black tides was another factor that contributed to the exposure scenario. The first black tide affected the *Rías Altas* between 13 and 19 November 2002, and no prevention protocol to protect the *Rías Baixas* was applied.

Figure 16: Example of beach in a less affected zone

Photo: Adela Leiro (2002)

Figure 17: Example of beach in a moderately affected zone

Photo: Ara.cat (2002)

Figure 18: Example of beach in a more affected zone

Photo: Diario Sur (2002)

Moreover, respondents reported that the fishing community in the *Rías Baixas* warned the governmental institutions that the oil spill could arrive in that area; however, their demands to prevent exposure were ignored, which coincides with the testimonies registered by Raya, Torres and Guiteras (2002).

> *"Eh..., lo que colmó la gota del vaso fue que desde, pues, yo no sé, pues de consellería, de Madrid, de Santiago, de Moscú! nos decían <<qué no, no, que en vuestra zona no había fuel>>. Nosotros les decíamos <<mira tenemos aquí fuel en bolsas, venga a recoger este y de paso empezamos a recoger en el otro>>. Quiero decir, creo que en cima al principio lo que más cabreó fue..., es que no entiendo qué querían tapar. No había nada que tapar ni que manipular, es que estaba ahí! Estaba, y bueno, en un día, dos días se pintó la costa de negro."*
>
> Participant 1 - Shellfisherwomen

Afterward a second and then a third black tide occurred, from 19 November to 10 December 2002 and from 6 December to 8 January 2003. These spills followed a different flow pattern than the first, carrying oil to the *Rías Baixas* through currents, river plumes, and other weather factors. The only measures taken to decrease contamination in shellfishing zones came from shellfisherwomen in conjunction with fishermen and volunteers.

The *Rías Altas* were more affected because they received the first oil slick. However, the *Rías Baixas* faced different conditions: in addition to the lack of disaster preparedness, government mismanagement occurred when it didn't send immediate protection, which contributed to an expansion of the affected zones.

6.2.4.3 Shellfisherwoman sensitivities as a result of the Prestige oil spill

An oil spill in a marine environment can produce changes in ecological and human processes, and both are interconnected. In the case of shellfishery, first the ecological process is damaged. Shellfish feed by filtering water and bioaccumulate toxins from oil. Sequentially, the human process is affected because the contamination makes shellfish inappropriate for human consumption. Therefore, the main consequence for shellfisherwomen is the interruption of fishing activities (Webler and Lord 2010). These processes resulting from the black tides are progressive and interrelated, which is why shellfisherwomen were affected to different sensitivity degrees on a differentiated time scale.

The short- and middle-term impacts were those that occurred immediately after the Prestige oil spill, changing the environment and its social condition on a temporary basis. On the other hand, the long-term impacts were those changes in the socio-ecological system that have been prolonged in the last decade after the disaster (Webler and Lord 2010).

Short- and middle-term impacts

Table 7 shows indicators detected in the interviews of the damages provoked by the Prestige oil spill in short- and middle-term. They were classified into five categories of sensitivities, according to Webler and Lord (2010): culture, psychological, commercial shellfishing, government and governance, and social interaction.

Table 7: The taxonomy of process and impacts associated with the Prestige oil spill indentified by interviewees

INTERMEDIARY SOCIAL PROCESSES		AFFILIATED IMPACTS	
Category	Name of process	Impact variables	Indicator
Culture	Perceiving beauty	Aesthetic values	Changes in landscape after oil contamination
	Making meaning and living one's identity	Loss of heritage	Natural heritage damaged
Psychological	Rationalization of event	Distress about damage to community	Emotional stress
			Fear of lost economic self-sufficiency
			Fear of lost shellfishery identity
		Distress about harm to animals and nature	Concern about marine biodiversity survival
Commercial shellfishing	Shellfishing	Interruption of shellfishery as a way of life	*Rías* temporarily closed between 3 and 12 months
	Shellfisherwomen employability	Employment	Approximately 1,350 shellfisherwomen out of work in the study area
Government and governance	Relief payments	Equitable and fair relief	Imbalance in the distribution of payments
Social interaction	Social conflicts	Public outrage	Perceptions that there were irregularities in the relief payment process
		Stigma of seafood from region	Decreased volumes of sales in zones that returned shellfishery early

Source: Own elaboration based on interviews

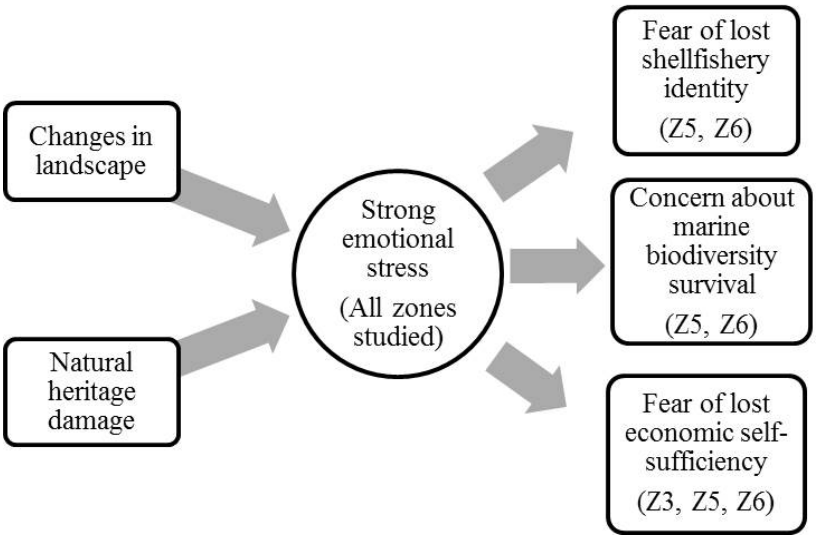
Cultural and psychological sensitivities

The indicators of the culture and psychological categories showed that the immaterial damages occupied a central axis of the Prestige's symbolical representation, as shown in Figure 19. In all studied zones, respondents reported that the changes in landscape and the damage to natural heritage represented a strong emotional stress. Even in the less affected zones the shock was registered, since the lack of information about the catastrophe's dimension and the further uncertainty created a staggering environment.

> *"Emocionalmente, vamos, era para coger una depresión. Quiero decir, sí te afectaba, ya que tu te levantas cada mañana y tu, esté el día gris o esté soleado, hay más luz, hay más color, hay menos color, pero siempre hay color, más matizado, más oscuro, más brillante... Era, vamos, no veías luz ninguna! Tu te levantabas y veía una costa negra, pero negra de verdad! Y no era algo ficticio, era algo que realmente... Entonces yo no lo daba, yo y mucha gente, no lo daba por digerido, no lo asumes, y no ves luz, quiero decir, te quedas impactado. Pensé que a lo mejor no volvía a trabajar como percebeira, y eso sí que ya no era capaz de digerirlo."*
>
> Participant 1 – Shellfisherwomen

Furthermore, three other kinds of immaterial damages emerged in some zones. In Z5 and Z6 the Prestige represented a threat to both shellfishery identity and marine biodiversity. In Z3, Z5 and Z6 the catastrophe also represented a threat to their economic self-sufficiency.

Figure 19: Immaterial damages as a result of the Prestige disaster

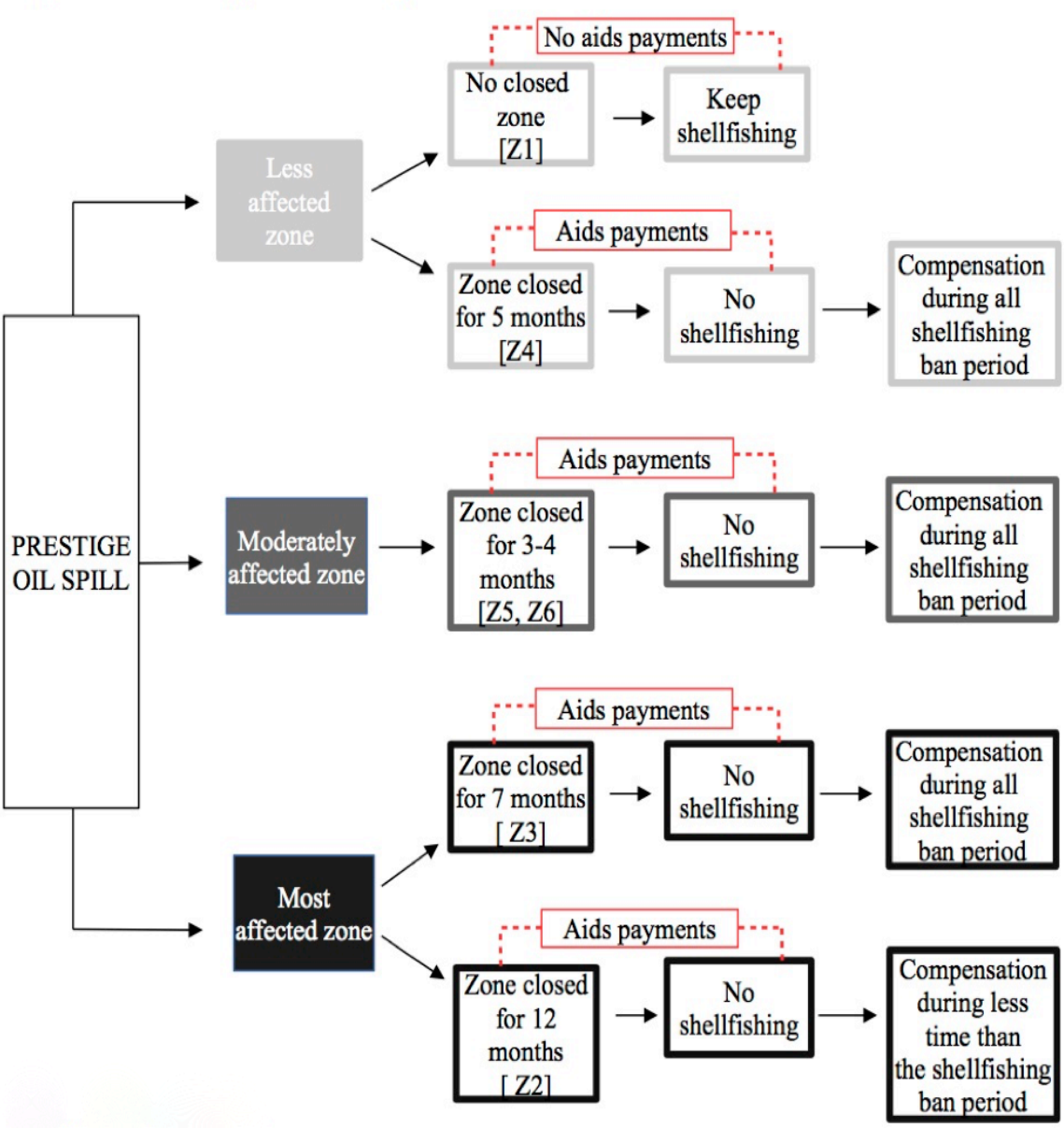


Source: Own elaboration based on interviews

Commercial shellfishing and Government and governance sensitivities

The shellfishing ban resulting from oil contamination was the main impact indicator mentioned by interviewees that relates both categories: commercial shellfishing and government and governance. Prohibition occurred at different moments on the Galician coast, first in the *Rías Altas*, then in the *Rías Baixas*. The *rías* were closed for 3 to 12 months. Firstly the criteria to close the zones depended on the pollution stage of each area however discrepancies were found when comparing the exposure level of zones to the oil spill, as depicted in Figure 20. The main problems detected are related to a disproportionate shellfishing ban period and different conditions for relief payments.

Figure 20: Shellfishing ban according to each affected zone



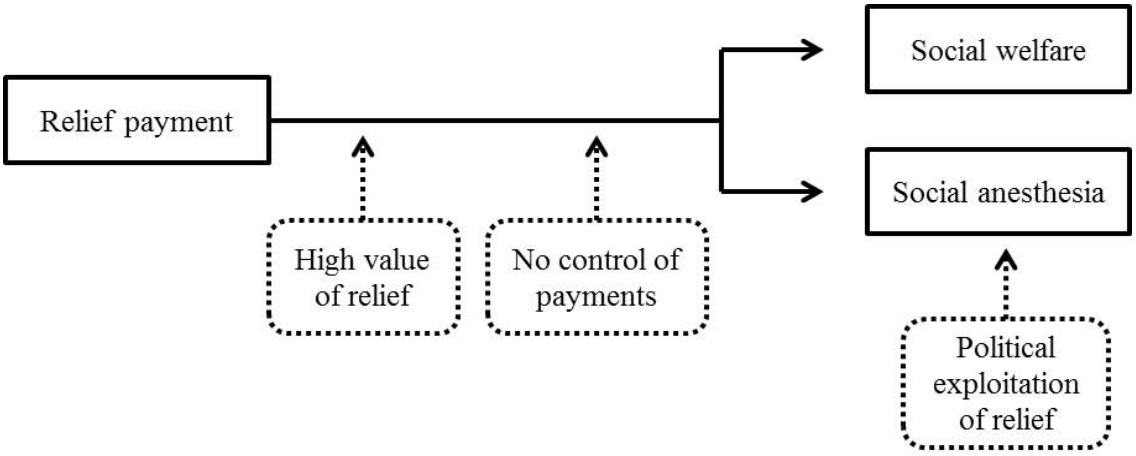
Source: Own elaboration based on interviews

The less affected zones presented situations of greater divergence. On the one hand, Z1 had no interventions while Z4 maintained the shellfishing ban for five months with government relief during this entire period. In the moderately affected zones, Z5 and Z6 had an equivalent period of banned shellfishing and relief payments. However, these zones received less government financial assistance then Z4, a less affected zone. Finally, most affected zones also had unequal treatment, especially regarding relief payments. Z2 had a longer shellfishing ban but did not receive compensation during that time, as Z3 did, which led the shellfisherwomen of these zones to a greater economic dependence of their husbands or other breadwinner.

Social interaction sensitivity

The last category of sensitivity reflects the social perception of relief payments management and the suspension of the shellfishing ban. With regard to the first issue identified, interviewees considered relief payments were a fundamental tool to guarantee a minimum livelihood in a disaster situation. Nonetheless, in Z1, Z5 and Z6 they pointed out problems in the payment mechanism, as represented in Figure 21.

Figure 21: The Galician shellfisherwomen's perception of the relief payments in Z1, Z5 and Z6 impacted by the Prestige disaster on the Galician coast



Source: Own elaboration based on interviews

According to the respondents, the amount paid became a problem because it exceeded the average income in the fishing sector, which had already been demonstrated by Fuentes-Castro (2005). Each sailor, shellfisherwomen, net menders or fish auction's staff earned 40 euros per day of inactivity, including Saturdays and Sundays. In addition, added to the 40 euros, those who had participated in cleaning the beaches received 36 euros per day. In 2001, the average income per day for coastal fishermen was 42.05 euros: 17.47 euros to shellfishermen on vessel and 12.24 euros to

the shellfisherwomen (Fuentes-Castro 2005).

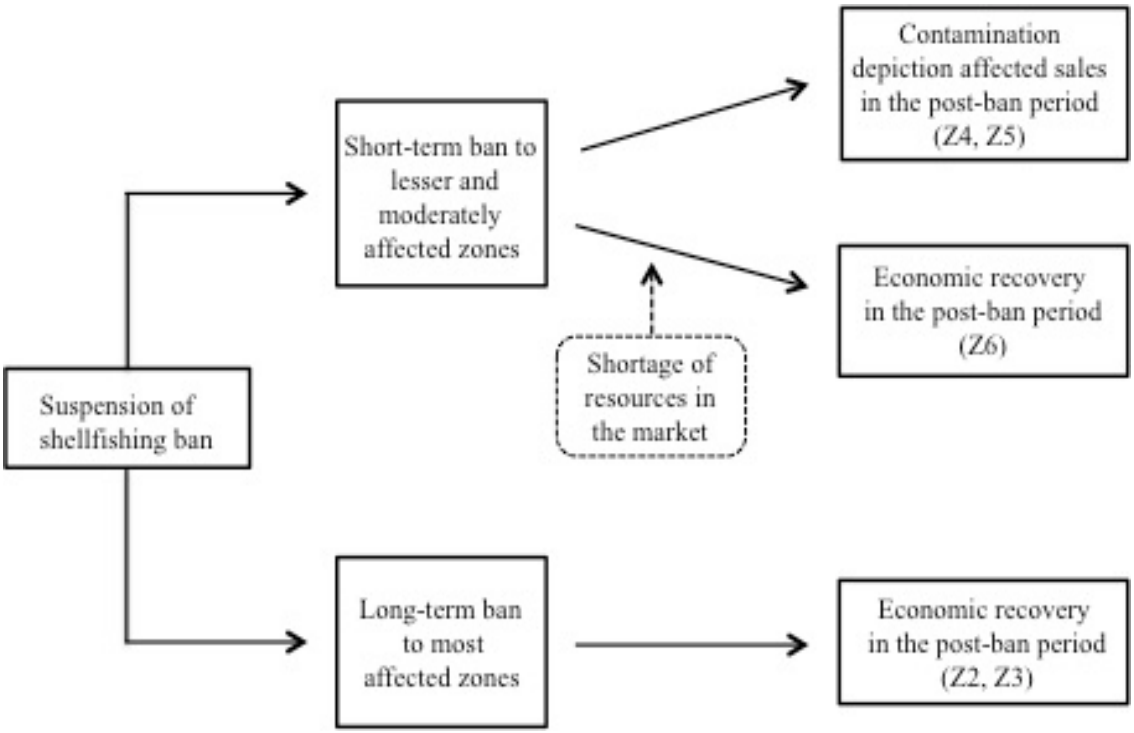
Also, the lack of effective payment control was an irregularity raised by interviewees that enabled non-taxpayers of Social Security to receive relief. These factors had two social main consequences. The relief offered social welfare to the sector, but at the same time discouraged some of the beneficiaries from participating in recovery actions, like cleaning beaches or pressuring those liable for the damage. Respondents interpreted this anesthetic effect as evidence of the political use of the relief, and that was one of the reasons why the government received harsh criticism for its disaster management.

> *"Entonces esa gente que mientras esas playas no estuvieron reproduciendo como tenían que reproducir, estuvieron cobrando una cantidad de dinero desmesurada, pero desmesurada, sabe, desmesurada! Entonces esa gente que no tiene noción de lo que podía ser, de lo que podría traer, pues claro, estaban cobrando ese dinero, tirar pa lante, <<nosotros vamos a limpiar que vamos a cobrar un montón de dinero>>, y hubo gente, gente que no es que se hiciera rica, pero hubo gente que hizo unos chalés, unos coches alucinantes, gente... pero alucinantes, porque estuvieron cobrando un montón de pasta en estos momentos, pero un montón de pasta por tener las playas con el Prestige. Iban a limpiar, sí, iban a limpiar, pero hubo mucha gente que ganó una pasta ahí tremenda, pero tremenda, y palabras de decir "que venga otro Prestige como este", que hay gente que hizo una pasta increíble. (…) entonces yo creo que la gente no valora lo que le podría acarrear a largo plazo, sabes, entonces valoraron en ese momento que ganaron un montón de dinero y punto, el dinero que venía pa casa y ya estaba, pero no valoraron lo que les podía acarrear a lo largo, porque eso salió más o menos bien y el espacio lo recuperaron, entonces claro, es el pan de hoy pero el de mañana está en el aire, entonces hay gente que no sabe valorar esas cosas, sabes. Sabe valorar el "venga a nosotros, venga a nosotros, mientras chupamos, chupamos y después lo que pase, pasó". Pero a lo mejor pues tuvieron suerte de que eso más o menos estuvo ahí, después se controló, se limpió y después esas playas se recuperaron otra vez, unas antes y unas después, mientras tanto estuvieron cobrando una pasta, pero una pasta eh, que no son estos tiempos de ahora, que si fuera ahora no cobrarían porque no hay dinero, pero en esos tiempos eso fue una locura, una locura."*
>
> Participant 9 - Shellfisherwomen

Moreover, regard the suspension of the shellfishing ban, it brought to interviewees the perception that the zones suffered divergent consequences, as represented in Figure 22. Z4 and Z5 returned to shellfishery soon but did not recover sales immediately, because the recent images of contamination affected consumer behavior. Meanwhile,

Z6 quickly regained sales due to the high market value of its kind of shellfish. Z2 and Z3 also promptly regained sales, but in this case as a result of the long-term ban, given that resources had had enough time to recover, the accident's image was not recent, and the market had a seafood shortage.

Figure 22: Implications of the suspension of the shellfishing ban on each affected zone



Source: Own elaboration based on interviews

Long-term impacts

Respondents were inquired about the impacts in the zone in the last ten years, covering their perception of the changes in the social-environmental shellfishing system. The answers mostly described the marine conservancy status and the human factors that are linked to this. They used a comparative observation of the pre and post Prestige scenario to express their concern over three topics: availability of marine biodiversity elements, interference of other contaminant sources, and risk perception.

Perception of availability of marine biodiversity elements

Regard the availability of marine resources; interviewees were invited to evaluate the status of resources directly related to shellfishing, however they could contribute with their observation of other marine elements if they considered it relevant. Respondents did not stipulate the scientific name of the species. They used nomenclatures commonly known in those areas. For example, algae were called "commercial algae" or "algae to feed fish", and fish species were simplified to "fish" or "commercial fish".

"No sé, pero se ve las piedras muy diferentes. Aquí había algas, cuando nosotras comenzamos a trabajar en la mar, y no te estoy hablando de tanto tiempo, había muchísima alga que se recolectaba. Yo no sé decirte el nombre específico, nosotras llamábamos carrapicho, unas algas que son comestibles. Carrapicho, eh... cómo se llamaba la otra... las pintas, la otra que era.... Que eso ya no se ven, no las vemos en las piedras! Ahí pasa algo! No sé lo que es. Contaminación es, de lo que sea! [afirma con mucha convicción] Lo que sea es contaminación, pero algo pasa. Yo, a causa de qué, pues no lo sé. Mismo, antes del Prestige habían unos cangrejitos, y se veían, estaban todos por las piedras y se iban [hace la onomatopeya de un cangrejo], ahora ni eso se ve! Hay algo que les está matando... Eso sobretodo, eso cambió muchísimo. Antes había muchísimo más percebe, ahora no lo hay... Sí claro, o sea, si todos estamos encima, encima es normal que se termine, no? Pero, no sé decirte... Y algas muchísimas. Lo que más hecho en falta son las algas. (…)va muy poco a poco, tampoco se nota así, bum!, no. No se nota así. Lo que antes yo te había dicho, de que antes se notaba los cangrejitos esas haciendo ruido y ahora se ven muy pocos, tampoco fue de repente, pero claro, eso se va notando poco a poco, sabes, se va notando, sea lo que sea, el Prestige, las porquerías que se echan al mar... lo que sea."
Participant 5 - Shellfisherwomen

"Qué desaparecieron muchas especies de plancton, de arneirós, de las lapas, lo que está pegado a las piedras no. Después qué notamos también? Que faltaban, los biólogos no, que había algunas especies de fictoplancton, que es lo que comen, que desapareció. Hay una especie o dos que aun no apareció, que eso liquidó, terminó con ella. Entonces el marisco pues no comía, no tenía la suficiente comida para crecer, para engordar, para crecer y ahí afectó también. Qué mortandad por el agua..? Sí, eses años, en los siguientes años, notamos que hubo menos desove, menos juveniles, no, porque eso, tal. Pues, eso, con el paso del tiempo pues fue el mismo mar regenerando y limpiando. Qué hay huellas? Sí que hay huellas, porque eso se quedará ahí por muchísimos años."
Participant 7 - Shellfisherwomen

"Había un grupo de mariscadoras que dependían de la coquina y poco tiempo después del Prestige la coquina ha desaparecido de esa playa. Después del Prestige ocurrieron cosas que algunas pesquerías siguen produciendo incluso más que antes del Prestige, pero otras, en el caso de la coquina, que es una especie muy sensible a los cambios, había playas donde la coquina estaba presente como en la playa de Carnota, y prácticamente desapareció. Lo mismo sucedió con la coquina de Vijedo, en Lugo, que también ha prácticamente desaparecido de la playa."
Participant 13 – Researcher

The literature contains no reference to the scarcity or disappearance of marine species in that zone after the Prestige disaster, although some studies demonstrate significant changes in the status of some of them (Abad et al. 2010; Bernabeu et al. 2009; Bernabeu et al. 2013; Izagirre et al. 2014; Junoy et al. 2013; Marigómez et al. 2013).

For interviewees, marine biodiversity was affected on two levels, disappearance and scarcity, as shown in Table 8. Disappearance refers to the perception that an element of marine biodiversity was no longer visible from the Prestige accident until the present time. Respondents in Z1, Z5, and Z6 reported the disappearance of at least one element after the disaster. Scarcity, on the other hand, refers to the perception that the availability of an element of marine biodiversity decreased from the Prestige accident until the present time, which was true only for respondents in Z6.

Table 8: Avaliability of marine biodiversity elements over a long-term period

LEVEL OF AVAILABILITY	MARINE BIODIVERSITY ELEMENTS	ZONE
Apparent disappearance	Algae	Z1, Z5, Z6
	Limpet	Z5
	Small barnacles	Z5
Apparent scarcity	Commercial fish	Z6
	Sea urchin	
	Octopus	

Source: Own elaboration based on interviews

The interference of other contaminant sources

Most interviewees reported that their zones have been pressured by several sources of pollution over the past few years; therefore they considered difficulty diagnosing long-term impacts of the Prestige. According to them, this is due to the lack of technical knowledge in monitoring, combined with the persistence of other contaminations sources on the Galician coast.

> *"Siempre hay vertidos de industrias, de alcantarillados, de... eso, antes... ahora es... porque nadie hace nada... hemos denunciado, hemos hecho tal, cual, pero nada."*
>
> Participant 6 - Shellfisherwomen

> *"Eso por un lado, pero por otro lado es una costa tan intensamente utilizada que*

diferenciar el impacto de una marea negra cuando han pasado 4 o 5 años de los vertidos urbanos, de la sobrepesca que también es una realidad, de las malas prácticas pesqueras, de la pérdida de hábitat, de la acuicultura, del cultivo mismo de mejillones …"
Participant 12 – NGO agent

The main marine pollution sources identified by interviewees were: bilges of ships and water treatment plants (Z2); general pollution (Z3); aquaculture (Z4); drains and industrial waste (Z5); and bilges of ships (Z6)

This information is supported in Galician and European government reports. According to these sources, the Galician coast is drastically affected by urban wastewater, water draining from farms and farmland, and industrial waste. Moreover, of the 29 beaches with poor quality bathing water in Spain, 23 were located on the Galician coast (EEA 2016; Xunta de Galicia 2005).

As a consequence of this high level of contamination on the Galicia coast, the number of shellfish production zones classified by the European Union as type C has increased. Shellfish from a zone C must be intensively purified before its commercialization (Xunta de Galicia 2005; European Union 2004). Shellfisherwomen are greatly concerned about this issue because it represents a real loss of marine environment quality and because they lose income. Therefore, type C zones reinforce their concern about the cumulative effects of the Prestige oil spill.

Thus, respondents suspected that the Prestige could have changed the marine environment, causing the disappearance and scarcity of marine biodiversity elements. But, they could not confidently affirm that the Prestige was the sole agent. In addition, they were concerned about the smoke screen generated by the disaster, since it masked the effects of other sources of pollution and the overexploitation of resources.

Risk perception of oil contamination
To interviewees in Z1, Z5 and Z6 (those that identified an anesthetic effect of the relief), most beneficiaries clearly developed a risk perception, despite earning subsidies. In that new model, the fishing community increased their concern about conservation and assumed that the marine environment is constantly exposed to a slick.

However, the same respondents considered that the relief payments interfered in the risk perception over a long-term period. For them, the relief worked as a buffer that prevented some of the beneficiaries from realizing the consequences of an environment totally devastated by contamination. Interviewees reported that the

phrase “Another Prestige could happen again” became common in the fishing community, especially in times of economic crisis, a behavior mostly rejected by the shellfisherwomen.

> *“Yo creo que nosotros, a los marineros y todos los percebeiros y demás sectores en aquel momento tuvimos la suerte, por llamarlo de alguna forma, que las arcas del Estado estaban boyantes, era tiempo de bonanza económicamente. Si hoy vuelve a caer algún Prestige, poco menos vamos a recibir, porque el gobierno no iba a indemnizarnos como lo hizo entonces. Yo creo que se nos tapó la boca muy rápido con dinero. Es lo que he pensado entonces y lo que pienso ahora. (…) y la mayoría muy gustosos les pareció bien, si aun en cima cobro y no tengo que trabajar pues mejor, a mi qué mal me da? Que sea el Prestige o que sea una marea verde! La realidad es esa, hay gente para todos los gustos. Que luego pasó que eso fue viciar al sector vale. Porque luego se da por hecho que cada vez que pase algo no es tu problema, es problema del que te tiene que pagar. Yo creo que ahí, y en este caso hablo contra mi, pero, es así.”*
>
> Participant 1 - Shellfisherwomen

Furthermore, these respondents conclude that the macro-economic situation of a country influences the conditions with which people affected by a disaster are chosen for relief. In the years surrounding the Prestige accident, Spain's government enjoyed favorable economic conditions, which allowed higher relief spending. This prosperity no longer exists, due to the economic crisis that began in 2008. For this reason, the interviewees were very worried about the lack of awareness of the problem inside the fishing sector.

6.2.5 Discussion

The high exposure of the shellfishing zones

The evolution of the Prestige's three black tides highlighted the lack of government efforts to prevent the expansion of the oil spill and put the main shellfishing zones at risk. Some prevention factors would have been decisive in safeguarding the *Rías Baixas*, an important production area.

Due to the time between each black tide, there was a temporal advantage to protecting this area. In addition, the features of the spill and the area conditions were strong indicators that the prevention zone should have been expanded. On the other hand, shellfisherwomen had a limited access to decision making-power in order to warn about the risk of oil contamination in those zones. So, in this stage of the disaster management, not adopting preventative measures and excluding the expert knowledge of shellfishing collective were failures that contributed to expand the affected area.

Since the Galician coast is a peculiar territory with favorable conditions to shellfishing, it is not a simple solution to shellfisherwomen migrate in search of new productive zones. Therefore the Prestige represented a great hazard to the artisanal shellfishing.

Shellfisherwomen could have contributed to the disaster management from two strategic perspectives: with their knowledge of the zones, indicating the most vulnerable shoreline points and the biological and commercial value of the species, and with their awareness of the potentialities of their own collective to act in an oil spill response. The advantages of participative disaster management have been demonstrated in literature (Khalafzai and Nirupama 2011; Syafwina 2014).

The relevance of the immaterial impact: the shellfisherwomen's experience

The Prestige's immaterial damages were reported in all studied zones, even in the less impacted areas, which brought more subjective consequences than expected. The contamination threatened the shellfishery identity. Working as a shellfisherwomen means more than occupying a job position, it is an opportunity for women to develop productive labor in a historically male-dominated environment. Besides this, shellfishing compared to other jobs allows freedom and autonomy to guarantee women the reconciliation of family life. Consequently, these identity elements are not easily replaceable, engendering unsure futures for women in those zones.

The emotional stress also revealed the shellfisherwomen's interpretation of the environment. Despite the coastal zone be a workplace, for them it has a clear symbolic-cultural perspective. They considered the sea and its life cycle as part of their identity as a fisherwoman. Their concern and respect for marine life shows their ability to comprehend their dependence on this ecological system and to develop a high sense of belonging to the environment. This demonstrates how relevant identity can be to understanding subjective impacts (García-Mira et al. 2006; Gill, Picou and Ritchie 2012).

Anomalies and vices in the disaster management

The management of affected zones did not follow a clear standard. The disparity among the degrees of exposure, the shellfishing ban periods, and the relief payments indicates disproportionality in the assistance provided to affected zones. As a consequence, some damaged zones were not satisfactorily assisted, and shellfishery was impacted. Measures to manage the impact provoked inequities in the shellfisherwomen collective.

In addition, the lack of oversight over the relief payment suggests the need for greater public control of disaster management. Negative effects of compensations have been

poorly reported in the literature, and are usually related to a culture of dependency (Kim et al. 2014; Safford, Ulrich and Hamilton 2012). Transparent social control would reduce anomalies and vices in compensation management. If affected people report their real needs, relief resources would be used to meet a real demand instead a hypothetical situation.

Nevertheless, to ensure a broader view of the relief demands, women should have real opportunities to participate in disaster management. In the case of the shellfisherwomen at the time of the Prestige disaster, their marginal status in the fishing collective led their specific needs to the invisibility. That is why it is relevant to create external mechanisms that could allow for equitable participation and access to decision-making power to all affected groups, including the women demands.

The gaps in long-term impact perception

The difficulty of shellfisherwomen to identify long-term impacts reveals the importance of a monitoring program, including the local perception of changes. In this sense, women with a direct link with the environment can contribute with knowledge of the resources they manage, as well as about their territory. A participative long-term monitoring gender-based would lead to a deeper understanding of the environmental and social changes caused by a disaster, adding a differentiated approach over the same problem. Also, this kind of monitoring would allow greater control of other pollution sources that are constantly pressuring vulnerable coastal zones.

To be effective, monitoring should follow two principles: access to information and equitable participation. The first one is an environmental right usually neglected or seen as less important by governments, despite being essential to improving resource management. This issue has increasing importance in different environmental contexts (Ginige, Amaratunga and Haigh 2009; Khalafzai and Nirupama 2011), especially for women's groups. For shellfisherwomen, protecting this right empowers them in the monitoring process.

Regarding access to equitable participation, it is noted that the local people's knowledge contributes to environmental management. Therefore, the opinion of the technical staff should not be the only consideration to make a decision in the monitoring process. Moreover, equity would assure that shellfisherwomen could contribute with their knowledge and their perceptions of environmental changes (Franz-Balsen 2014; Ginige, Amaratunga and Haigh 2009).

Environmental awareness about the damages

The rejection of shellfisherwomen to the idea that an oil disaster is an easy way to make money leads us to discuss how they evaluate the changes in the marine environment. Most of shellfisherwomen are aware of their vulnerability status into this socio-ecological system, what favors their risk perception. The context in which they were immersed, where reproductive and productive labor are interwoven, contributed to a different experience of the impacts.

For their lives, the ethics of care is a central element that conducts great part of their actions. As professionals, they understand the importance of the sisterhood within the collective itself, where the action of one directly affects the other. As individuals, they realize the systemic connection between marine biodiversity and the livelihood of their families and nearer social net.

The perception that the Prestige disaster could affect future generations, both of the marine life cycle as the continuity of the shellfisherwomen profession; the impression that there was unfair distribution of relief benefits; the fear of the irreversibility of impacts on the marine environment; and the failures of communication with government during disaster management are evidences that explain the ripening process of shellfisherwomen regarding the environmental awareness and the sustainability of fishing.

Therefore, a relevant strategy would be to encourage actions of disaster preparedness and environmental awareness considering the way each social group views nature and how the gender roles can influence in it (Gaillard and Mercer 2012; Renn 2004). This could decrease the vulnerabilities of the social-environmental system, and would better anticipate the risks.

6.2.6 Conclusions

This paper has analyzed the gender dimension of social impacts consequences of the Prestige disaster on Galician shellfisherwomen, in Spain. First of all, it expands the previously homogeneous view of the Prestige's impact, highlighting the different effects resulting from the specific characteristics of the spill, the environment and the social group studied. Moreover, this work adds original information to help comprehend how women’s groups that are highly dependent on the natural environment can be affected by an oil disaster.

In the studied zones, the results detected the main failures that heightened exposure to the oil spill. The lack of disaster preparedness, the particular features of the oil spill, and the authorities’ disregard for the fishing community's warning to expand the prevention area were the main factors contributing to the increased exposure of the shellfishing zones, especially in the *Rías Baixas*, the main shellfishing area in Spain.

With regard to the shellfisherwomen's sensitivities in relation to the Prestige's spill, results shown short- and middle-term impacts more associated with immaterial damages and disproportions in the treatment and assistance to affected zones. In other respects, the main long-term impacts identified were the changes in resources availability, the interference of other pollution sources in marine conservancy, and conditions that interfere in the establishment of a risk culture.

Four main conclusions are drawn from the effects of the Prestige disaster on Galician shellfisherwomen, followed by recommendations to reduce the exposure of the zones and the sensitivity of the shellfisherwomen group to a future oil spill.

First, this study has shown that the shellfishing zones exposed to the oil spill could have been reduced with the participation of shellfisherwomen in decision-making during disaster management. Their expert knowledge of the territory and the shellfishing, as well as their capacity to mobilize their peers, would have been key elements for preventive measures. Including women in fishery in disaster management must overcome their invisibility in decision-making processes and recognize them as agents of their own demands.

Second, the subjective experience of shellfisherwomen with the degraded marine environment broadens the context of the sensitivities of the Prestige disaster. The impacts on the territory and the threat to the shellfisherwomen identity have contributed to the establishment of a risk perception regarding the coastal degradation. This suggests that empowering the shellfisherwomen's group could reflect positively on coastal conservation, especially to avoid oil contamination. In addition, their capacity to create networks would promote new strategies to sensitize others groups to marine sustainability.

Third, decisions on the management of contaminated coastal areas should consider the social-gender perspective of the problem to avoid discrepancies in the prohibition of access to damaged natural resources and the distribution of relief. Besides direct impacts on ecological processes, contamination can affect social processes in a heterogeneous way. This interrelationship must be understood to minimize the impacts on the most vulnerable groups, such as shellfisherwomen.

Fourth, it is relevant to marine conservancy to promote participatory monitoring to identify long-term impacts after an oil disaster. A broader perspective of the damages could be achieved by including women highly linked to environment to improve the

control of pollution and its effects. Furthermore, these measures would reinforce the control of other pollution pressures.

Thus, based on these conclusions, and learning from the Prestige scenario, this study recommends some measures to reduce anomalies in oil disaster management in coastal zones. It would be interesting to have the following recommendations applied jointly by government agencies, non-governmental agencies and local stakeholders:

- Recognize shellfisherwomen as local stakeholders, and raise them to the role of community agents of sensitization against the marine pollution through an environmental education program target to the fishing collective.
- Guarantee the representation of the fishing community in decision-making processes during oil disaster management in coastal zones, fulfilling the guidelines proposed by the Plan for Gender Equality in the Fishery and Aquaculture Sector (2015-2020) that favors gender equity. A disaster preparedness co-agenda between governmental environmental and fisheries stakeholders and fishing communities could strengthen women's participation.
- Observe the particular social-gender and environmental features of each affected zone, maintaining clear criteria about an oil impact scale through multidisciplinary studies. Building a database of vulnerable locations, including their social, gender and environmental profile, could facilitate impact assessment and, consequently, the decision taken in disaster management.
- Create criteria and inclusive mechanisms that allow the local fisherwomen community to evaluate the long-term impacts of a catastrophe. Their knowledge of the water quality, status of fishing resources and recent changes in the marine environment can be recorded in diaries to feed a common database that can be share with research institutions.

Finally, it is noted that inserting gender in social impact assessment enables verification of the complexity and totality of damages to social groups. When a survey is designed with gender bias, without considering women as potentially affected by impacts, its results hide other sensitive dimensions usually excluded or scorned in a merely technocentric evaluation. Therefore, the inclusion of women's perceptions in future oil disaster assessment studies should be encouraged, which also benefits the management of coastal areas highly exposed to oil spills and minimizes damage to the largest number of social groups in these areas.

6.3 The resilient actions of the Galician shellfisherwomen in the face of the Prestige oil disaster

Figure 23: Shellfisherwomen weigh the shellfish after classifying them in the fish auction

6.3.1 Abstract

Fishing communities have been increasingly pressured by oil disasters, particularly endangering the most vulnerable groups in coastal areas, such as women in fishery. Based on a gender and resilience approach associated with a temporal perspective of the post-disaster, this paper aims to identify and analyze the resilient actions carried out by the Galician shellfisherwomen to cope with the Prestige oil spill in Spain, 2002. The results showed that the various actions developed by the shellfisherwomen in the preparedness, response and recovery stages were essential for the conservancy of the shellfishing zones in a short and long term. Its social, economic, environmental, ethical, and gender features worked as motivating factors for its actions. They demonstrated a high resilience capacity despite their invisibility in the post-Prestige disaster. Therefore this study makes some recommendations to strengthen the resilient potential of this women group.

6.3.2 Introduction

The oil disaster is currently an important risk factor for coastal societies. The greater the link with the marine environment, the greater the damage to human groups (Lin, Shih and Chiau 2013; Rahikainen et al. 2014). In this context, fishing communities are one of the most affected by an oil spill in coastal zone. However, members of this collective suffer damage in different proportions, and women in fishery are often the most vulnerable due to their precarious socioeconomic situation and lack of decision-making power (Childs 2006; Deb, Haque and Thompson 2015; Eklund and Tellier 2012). These elements can influence the reaction of this group in context of risk, designating their resilience capacity.

Up to now, there are scarce studies on the role of women in an impacted environment. Literature generally reports to women's groups only as victims of a disaster, making their performance in the resilience process invisible (Childs 2006; Fothergill 1999). Therefore, this paper aims to identify and analyze the resilience actions developed by the Galician shellfisherwomen in the Prestige oil disaster in Spain, 2002. It will focus on understanding how actions were carried out, their short and long-term consequences and the factors that led shellfisherwomen to adopt a proactive practice.

The next section of this paper is devoted to the theoretical framework and explores four issues: women representativeness in a disaster context; the process of social resilience; resilience actions from a gender perspective; and the Prestige disaster and the Galician shellfisherwomen. The following sections present the methods of study, the results, a discussion section and the conclusions.

6.3.3 Theoretical framework

6.3.3.1 Women representativeness in a disaster context

Disasters are stressful events that dramatically modify natural systems, and often promote implications in human systems. The origin of the disasters can be for natural reasons or for man-made actions, as it is the case of an oil spill. The event should be viewed from an all-encompassing approach, considering from the pre-post-disaster period (Blaikie et al. 1994; Paul 2011). From this perspective it is possible to understand why some social groups are victims and what leads them, or not, to develop resilient actions.

It is in this context that gender issues need to be addressed to reveal women as an important part of affected people, because a disaster does not proportionally interfere in all social groups (Anugwom and Anugwom 2009; Blaikie et al. 1994; Cutter, Tiefenbacher and Solecki 1994). To this paper, gender will be understood as specific

roles and actions assigned to sexual bodies, varying according to the historical, social and cultural context (Agarwal 1992; Scott 1986). The concept of gender brings a complex view of the disaster problematic, and when it is associated with other elements, such as socioeconomic and geographical conditions, contributes to the analysis of the risk situation faced by women.

Some scholars have reported the effects of these events on women groups, usually associated with natural disasters such as tsunami (Becker 2009; Childs 2006) hurricane (Cupples 2007), famine (Edgerton-Tarpley 2004), bushfire (Eriksen, Gill and Head 2010), floods (Fordham 1998), or drought (Alston 2009). This has been a great step forward, making women visible in this context. It has contributed to broadening the view on the particularities of women in an affected environment. However, in contexts that offer other types of risk, such as in technological disasters, there are still many gaps in women's actions, especially in the resilience stage.

6.3.3.2 The process of social resilience

Social resilience is a process in which human groups develop strategies to overcome stressful events that modify their normality. In this process, people must have the ability to adapt themselves and their environment to the new conditions created after a disaster (Cutter et al. 2008; Kwok et al. 2016). According to Alexander (2009), the resilient actions start from the moment a disaster occurs, and develops into three main temporal phases: preparedness, response and recovery.

The preparedness phase covers the period immediately prior to the completion of the disaster in a specific area. The response phase corresponds to two stages that occur almost simultaneously: the relief, that is, the immediate post-disaster period, and the rehabilitation, a stage that can extend from two or more months, depending on the damages in each area. Finally, recovery is the last and the longest phase because it covers approximately ten years after disaster (Alexander 2009).

Resiliency is often a centralized process; the government and the specialists take decisions in a top-down direction, distancing those directly affected from participation. This scenario has persisted despite the fact that local knowledge and community-based actions have been shown to be key elements for post-disaster success (Gaillard and Mercer 2012; Reichel and Frömming 2014, Wisner, Berger and Gaillard 2017).

Local stakeholders can contribute through their view of their own reality, taking into account local geographical, cultural, environmental and social specificities. And women are key collaborative actors who have been systematically excluded from participation in the resilient process, which deserves special attention (Cutter, Ash and Emrich 2014; Imperiale and Vanclay 2016).

6.3.3.3 Resilience actions from a gender perspective

A gender perspective on resilient actions seeks to understand and give visibility to the mechanisms used by women's groups to cope with the disaster's impacts. To achieve this goal, it is necessary to consider that its actions are normally based on specific characteristics, which may not follow a linear logic or have technological support (Childs 2006; Enarson 1998; Scharffscher 2011). The experience of life and inventiveness are, in many occasions, their main resources to react immediately and to rebuild the damaged environment.

Although using unconventional tools and strategies, such as those applied by government and relief agencies, their resilient actions have proven to be effective in contributing to various post-disaster scenarios. Fothergill (1999) reported on women's participation after the Grand Forks flood in United States, in 1997. In post-earthquake contexts, women's actions were registered both in the Gölcük earthquake in Turkey, in 1999 (Ganapati 2012), and in Kashmir's earthquake in Pakistan in 2005 (Hamilton and Halvorson 2007). The resilience of women in tsunami was also reported, as was the case of Batticaloa in Sri Lanka in 2004 (Scharffscher 2011), and Maule and Bío-Bío in Chile in 2010 (Magaña-Frade, Silva-Nadales and Rovira-Rubio 2010).

In all of the scenarios mentioned above, women performed several resilient actions, such as caring for the physical and emotional health of their families, rebuilding damaged property, or even recovering the local economy through independent actions. Each context had its specificity, varying according to the type of disaster and the group of women directly affected. Despite the particularities, the actions followed the same pattern that was identified by Enarson (2000).

According to Enarson (2000), these actions of these women can be classified into three main categories: reproductive, productive and community labor. The category most commonly found in the literature is reproductive labor, which includes those activities performed strictly at home to maintain the well being of family members. The second and less common is productive labor, including actions taken by women from a professional role (such as doctors or firefighters), or through the production of goods for the survival of the family. The last category is community work, with the goal of promoting social cohesion.

Even in industrialized societies, a relevant part of women's labor is done in the private sphere. On the other hand, women's actions in the public sphere are not sufficiently recognized or are considered less relevant to society. This invisibility of women's contribution to social systems is reflected in the resilient process; and, as a

consequence, they are depicted much more as victims of a disaster than as agents of change (Childs 2006; Fothergill 1999).

Gradually, disaster resilience studies have showed that women are often at the forefront for assist their families or promoting measures to cope with a disaster in their community (Enarson 1998; Ganapati 2012; Hamilton and Halvorson 2007; Perera-Muraback 2013). That is why it is relevant to deepen the researches on the actions of women resilient, expanding the knowledge to different contexts and with different women groups. In this way, progress is made in understanding how social-environmental systems can be benefited through their resilient strategies.

6.3.3.4 The Prestige disaster and the Galician shellfisherwomen

In November 2002, the Prestige oil tanker caused a major socio-environmental disaster with more then 66,000 metric tons of oil spilled. The catastrophe hit the Atlantic coast of France, Portugal and Spain, the last being the most affected area, especially near the crash site on the Galician coast. This is one of the most important shellfishing areas in the world, an activity that at the time of the accident occupied 8,286 people, of which 6,988 were women (IGE 2001).

The high number of women in shellfishing characterizes this activity as a feminized work, due to two main reasons. First, because there is a lack of opportunities for women in the fishing universe, still very controlled by male members. Second, since women are the main responsible in this area for family care, this work is one of the few positions that allow them to balance family with professional life (García-Negro and Zotes-Tarrio 2006).

Although their activity has a marginal status within the fishing universe, they contribute greatly to the environmental, cultural and economical scenario in Galicia. Shellfisherwomen manage the marine environment through artisanal techniques that are favorable to the conservancy of shellfishing zones. At the same time, they reinforce the local identity of shellfisherwomen, and promote a complex chain of work focused on the processing and sale of shellfish, mostly occupied by women (García-Negro and Zotes-Tarrio 2006).

These characteristics of the shellfisherwomen remained at risk in the face of the Prestige disaster. As a result of marine pollution caused by the oil spill, the shellfishing ban was the main consequence of the accident to shellfisherwomen, which lasted between 3 and 12 months depending on the impact level of each area (Laxe-González 2003). From this fact, over the last decade, this women group had to face drastic environmental, cultural, economical, psychological, social, and governance changes. That is why it is so relevant to understand how shellfisherwomen have coped with the

Prestige disaster, as well as if their strategies have contributed to overcome the impacts and recover their shellfishing territory.

6.3.4 Methods

This study is based on qualitative methods with the support of primary and secondary data, these as a complementary source. The primary data were composed of semi-structured interviews with three distinct groups of participants. Secondary data included reports from government and non-governmental institutions, newspapers, television broadcast, websites, and online photo galleries. To identity and analyze the shellfisherwomen's resilient actions, the Enarson (2000) classification was used to characterize the women's actions in a resilience process, combined with the temporary approach to a post-disaster period, proposed by Alexander (2009).

6.3.4.1 Participants

To attend the semi-structured interviews, 15 participants were selected through expert knowledge (Rossman and Rallis 2003), and were then classified into three groups. The first group was the Galician shellfisherwomen (n = 11), formed by women with a high professional level. The profile included in the research was to be a recognized leader with deep knowledge of the marine socio-environmental system and with direct experience with the Prestige disaster. Non-governmental senior staff (n = 02) formed the second group; In this case the requirements were the knowledge of the zones studied and the field experience in the post-Prestige disaster. Finally, the third group is composed of senior researchers (n = 02) with complementary experience in Galician shellfisherwomen's studies.

6.3.4.2 Instruments

Each visit in the studied zone was carefully registered in a field note. In addition to this, this research used as main instrument a semi-structured interviews guide. It had the same content to all interviewees, however the answers were adapted to the expert knowledge of each interviewees group. To attain the study objective, the guides were elaborated based on Enarson (2000) guidelines to gender and resilience analysis, associated with Alexander (2009) approach to the post-disaster period. The interviews questions addressed issues related with the shellfisherwomen actions in the post-Prestige disaster, as shown in Table 9.

Table 9: Main issues proposed in interview guides on shellfisherwomen's actions in the post-Prestige

EXPLORED THEMES IN INTERVIEW GUIDES
1. The consequences of the Prestige disaster for shellfisherwomen
2. The immediate reaction of the shellfisherwomen to the Prestige damages
3. The long-term actions of shellfisherwomen after the Prestige damages
4. The learning acquired by shellfisherwomen after the Prestige disaster
5. Social-environmental conditions of the zone in the last 10 years
6. The main changes in shellfishery after the Prestige disaster
7. The shellfisherwomen relevance in the conservancy of marine environment
8. The contributions of shellfisherwomen in a hypothetic new oil spill

Source: Own elaboration based on Enarson (2000) and Alexander (2009)

6.3.4.3 Procedures

Data collection

Data were collected through fieldwork between February 2013 to December 2014. Two field trips were conducted in three communities in the Rías Baixas respectively in April 2012 and June 2012. Three other shellfishing sites were visited on a field trip in the Rías Altas in July 2013. The Galician shellfishing communities were selected following two conditions: having a great number of shellfisherwomen and having been damaged by the Prestige disaster. An information network composed of researchers and fisheries institutions contributed to choose the best locations. The names of the studied zones are hidden to preserve the anonymity of the shellfisherwomen interviewed.

Fieldwork followed ethical procedures. The interviewees gave their verbal consent to participate in the study. The interviews were conducted mainly in Spanish, and in some cases in Galician. It was recorded on audio, and lasted on average of one hour.

Data analysis

The first step was to ensure the anonymity of all respondents, from their names, location and position (Denzin and Lincoln 2003). Then, each interview was transcribed and translated into Spanish, when necessary. Afterward, the data were processed trough a manual coding, combining different methods to extract the results (Saldaña 2009).

Encoding was initiated with an intensive reading of the data for an overview of the content. Subsequently, the First Code Cycle was carried out, which extracted the main information behind the interviewees' speech. For this study it was used the methods In vivo (codes created from the literal words pronounced by the interviewees), Process (codes that reflect a represented action), and Descriptive (codes that synthetize the essence of a fragment).

The target of the Second Code Cycle is to organize and summarize in a few thematic categories all the codes that emerged in the First Cycle. Two researchers reviewed these categories to ensure data consistency. Finally, the categories were interpreted according to the theoretical framework, resulting in the main resilience actions developed by shellfisherwomen in the post-Prestige.

6.3.5 Results

From the processing of the interviews, nine major resilience actions carried out by the shellfisherwomen were identified in the post-Prestige disaster. These actions were classified into three different periods of the disaster: preparedness, response and recovery. The data show that in all studied zones, shellfisherwomen engaged in at least one type of resilience action and their participation was continued over time. The following sections will treat how each action was developed in the different phases.

6.3.5.1 Preparedness

At the time of the Prestige crash, there was no protocol to prevent the oil slick on the Galician coast, either by the government or by the fishing community. The black tides of the Prestige evolved at different times. The northern part of the Galician coast, known as *Rías Altas*, was the first affected between 13 and 19 November 2002. Then, a second and third black tides affected both the north and south coast, known as *Rías Baixas*, respectively from 19 November to 10 December 2002 and from 6 December to 8 January 2003.

This immediate hazard scenario led shellfisherwomen to act quickly, creating their own strategies to protect the shellfishing zones, as shown in Table 10. According to the interviewees, the main strategy was to close areas with barriers (Figures 24 and Figure 25), in addition to monitoring the oil spill. Both actions were aimed at minimizing the impact of the Prestige in those zones. Only Z2 did not register any preparedness action due to the immediate arrival of oil.

> *"Sí, mira, por ejemplo, yo me acuerdo que nosotros fuimos, nos llamaron un día si queríamos ayudar y fuimos un día par la zona de al lado que es donde estaban preparando las boyas con las redes con la protección y fuimos un día a preparar todo eso. Preparamos raños con redes estrechitas para si tenían que salir algún día los barcos, para ir a recogerlas, como salieron, y en ese tema sí que fuimos a ayudar. Para evitar en nuestra zona estábamos todos preparados con las barreras, teníamos todo preparado, si en algún momento se nos acercaba en la ría, y estábamos todos organizados."*

Participant 8 – Shellfisherwomen

"Y yo me acuerdo, y nunca se me va a olvidar, las primeras barreras estaban ahí para poner, en la zona que te digo que ganábamos mucho dinero, y no era... estaban las embarcaciones de la Xunta porque me dijeron <<María, puedes estar ahí a las 7 de la mañana que van a estar los biólogos en el muelle y va a haber protección civil para ayudar y hacía falta alguna embarcación de gente del mar para también ayudar a inflar las ...>>, yo sí, bueno, no te preocupes. Llamé a unos cuantos y estaban aquí, pero claro, protección civil, el voluntariado, tu sabes que en el verano tienes muchos chicos que están en el voluntariado porque no están en los colegios, pero en diciembre? Cómo que no! Había nosotros! Entonces qué hice? Llamé a todos los de a flote, y ahí se portaron como caballeros [se ríe] "tooodo mundo aquí!", vinieron con las embarcaciones, y si los vieras saltar, que se les salía, las barreras no eran capaz de aguantar, saltaron en las rocas, para tirar las barreras, para se les hacer firmes ... Eso a mi no se me olvida, porque ellos llevan la vida en ello, o sea, según lo son los que más te rompen la cabeza cuando... también los llama... allí se volcaron al 100% y eso es para sacarles el sombrero! Y la gente, las mariscadoras cuando dijimos, bueno <<según vengan vamos limpiando...>>!

Participant 11 – Shellfisherwomen

Table 10: The preparedness actions carried out by the Galician shellfisherwomen in the post-Prestige disaster

Phase	Actions	Specificities	Area of occurrence
Preparedness	Closure of risk areas with barriers	Barriers provided by the government	Z1 and Z3
		Handicraft barriers made by shellfisherwomen	Z4, Z5 and Z6
	Oil spill monitoring	Monitoring offshore	Z1, Z3, Z6
	No preparedness action		Z2

Source: Own elaboration based on interviews

As for the use of barriers, it was an own decision of the shellfisherwomen, and two different situations occurred. In the first, respondents reported that the shellfisherwomen of the Z1 and Z3 of *Rías Altas* played a mediating role in asking for

barriers to public administration. In this case, a fluid communication favored the government's material support to contain the oil.

However, in the second situation, the shellfisherwomen of the Z4, Z5 and Z6 in *Rías Baixas* did not obtain the necessary material support despite all negotiations with the government, which forced them to self-organize to prepare their own handicraft barriers. They used home stuff and some fishing tools to make the barriers, such as stuffing quilts, bulk bags, cords, polystyrene foam and rubber.

Figure 24: Shellfisherwomen in a fish auction preparing handcraft barriers

Photo: Vítor Mejuto. La Voz de Galicia (2002)

Figure 25: Shellfisherwomen putting the handcraft barriers in the sea with sailors

Photo: Martina Miser. La Voz de Galicia (2002)

The other strategy developed, monitoring the oil spill, was recorded in Z1, Z3 and Z6. The peculiarity of this monitoring is that the shellfisherwomen made their contribution on land, observing the approach of oil spots to the beaches. Through their knowledge of the estuaries and the behavior of the ocean at that specific season (winter), they identified the most vulnerable points on the coast as well as the areas that deserved more protection for the value of biodiversity.

6.3.5.2 Response

Preparedness measures were not sufficient to avoid the catastrophe, because shellfisherwomen did not have time and, above all, sufficient resources. However, observing Figure 15 presented in **Subchapter 6.2**, which represents the exposure of studied shellfishery zones impacted by the oil spill, it is possible to see that some of hem were benefited from the shellfisherwomen's actions, as in the case of Z1 and Z4 (less affected) and Z5 and Z6 (moderately affected).

> *"Eh... quitábamos todo lo que se quedaba pegado sobre las piedras, lo quitábamos todo. Eh... todas, todas y todos, e incluso la gente de afuera que no pertenencia al mar ayudaban en ese sentido a sacar todo para que no quedasen*

los rastros de... que no quedasen ahí. Y ayudábamos a... si necesitaba la gente..., que los marineros trabajaban más, si necesitaban... si teníais que hacer de comer les traían una empanada pues cuando ellos llegasen podían... o si necesitaban aquí mano de obra en la lonja para ayudarles pues les ayudábamos, o si necesitaban...Trabajábamos todo lo que podíamos en lonja...., donde hiciera falta."
Participant 4 - Shellfisherwomen

"Entonces las mariscadoras yo creo que... me sigo manteniendo en la misma línea, en función de su capacidad organizativa hicieron todo lo que pudieron. A los dos o tres días que yo pasé por Lira, me acerqué al lugar donde estaba acumulado el mayor, una gran cantidad de petroleo, había como dos metros de petroleo en el agua, vamos, enorme, olía y todo aquello, he visto grupos de 10-15 mujeres nada más trabajando allí. Eran apenas mujeres recogiendo petroleo en la playa, y eso me llamó mucho la atención porque sólo habían mujeres trabajando en la playa, y los hombres solo se fueron sumando a medida que la administración les iba convocando, la motivación de las mariscadoras no fue la misma que la de los hombres. Ya llevaba 4-5 días de petroleo fluyendo allí. Hubieron sitios en los cuales las mujeres fueron las primeras a acudir para limpiar la zona de forma organizada, estuvieron por delante, mucho antes de que los pescadores o cualquier equipo de ayuda llegara."
Participant 13 - Researcher

"Pues la percepción nuestra... no vimos un papel concreto, específico de las mariscadoras, si no que estaban un poco dentro del paquete de pescadores, mariscadores. Nosotros sí tuvimos relación más con cofradías de pescadores, que específicamente con mariscadoras. Para nosotros estaba dentro un poco del mismo paquete. No tuvimos una relación especial, yo no lo recuerdo que tuviesen un papel diferenciado al de los pescadores o otros pescadores artesanales que veníamos trabajando. (…) Tu ibas vas allí y había mujeres que directamente no sabías si eran mariscadoras o lo que eran, te traían bocadillos, o estabas allí y y a parte de estar limpiando era ayudarte, tu estabas allí con todo puesto con la cinta esta cerrándote los guantes y te tenías que estar rascándote y necesitabas de ayuda porque no te podías rascar, o necesitabas sencillamente, estabas sudando por la frente, a veces venía gente que no estaba limpiando simplemente para eso, para darte agua o para poder quitarte un poco el sudor, entonces había esa gente.. y ahí en ese tipo de apoyo sí que había muchas mujeres pero tampoco sé si eran pescadoras o lo que eran, y sobretodo quizás eso era lo más valioso, que te llevaban bidones con agua, porque el agua en ese momento, a parte de beber para echarte un poco encima por quitarte el agobio... Ahí hay un elemento también yo lo que más recuerdo que es el olor, de estar limpiando y el olor se te

mete, sobretodo en zonas donde estaba fresca, se te metían por las narices, entonces necesitabas agua simplemente para darte la sensación de limpiarte. Entonces, muchas veces te traían botellas de esas de litro, de dos litros, pero muchas veces venía gente y te traía barriles, bidones de 5 litros y tal muchas veces para echarte por encima cuando ya te quitabas todo."
Participant 15 – NGO agent

Regardless of the level of impact, all of these zones documented some response action in both stages, relief and rehabilitation, as shown in Table 11.

Table 11: The response actions carried out by the Galician shellfisherwomen in the post-Prestige disaster

Phase	Actions	Specificities	Area of occurrence
Response-Relief	Management of cleaning equipment	Raise equipment to clean	Z3, Z5 and Z6
		Organize and distribute equipment for cleaning	
		Cleaning of tools	
	Logistics to assist people involved in rehabilitation	Cleaning of bathrooms	Z5 and Z6
		Cooking and distributing food	
		Raise and distributing clothing	
		Ensure the health of volunteers	
		Organize and provide hosting	
	Participation in rehabilitation planning	Active participation in meetings	Z5 and Z6
		Mobilization of shellfisherwomen and other people related to fishing	
Response-Rehabilitation	Beach cleaning	Cleaning their own zone	Z2, Z3, Z5 and Z6
		Cleaning of other zones most affected	Z1, Z4 and Z6
	Provide solidarity and support	To other shellfishing zones	Z1, Z2, Z4 and Z6
		To other fishing sectors	Z6

Source: Own elaboration based on interviews

Relief actions

The relief stage was aimed at providing immediate assistance to the fishing community and to the volunteers who had mobilized to assist in rehabilitation. The interviewees reported three main actions: the management of cleaning equipment, logistics to assist people involved in rehabilitation (Figure 26) and participation in rehabilitation planning.

In the first relief action, the shellfisherwomen of Z3, Z5 and Z6 participated actively in raising the cleaning equipment with entrepreneurs. They got personal protection material, such as boots, rubber gloves and masks, and also material that could help remove oil from beaches, as well as shovels, buckets and bins. Once raised, the role of shellfisherwomen was to organize, classify and distribute the material. Further, they were daily responsible for cleaning the tools impregnated by oil.

Figure 26: Shellfisherwomen managing an improvised kitchen and refectory in the fish auction to assist people involved in rehabilitation

Photo: José Manuel Casal. La Voz de Galicia (2002)

Another relevant role of shellfisherwomen registered in Z5 and Z6 was the logistics developed to manage care to people involved in rehabilitation, including shellfisherwomen themselves, fishermen and volunteers. The activities reported were cleaning bathroom, elaboration and distribution of food, rising and distribution of clothing, ensure the health of those people who worked on beach cleaning (removing excess of oil from their faces, hands and respiratory tracts, besides to supplying water to avoid dehydration), and finally organizing and providing housing to volunteers.

In Z3, Z4 and Z5 shellfisherwomen participated actively in the meetings promoted by the Fishermen's Guilds to organize the rehabilitation actions. It is highlighted the relevant role of these women as communicators to create group cohesion and to sensitize the shellfisherwomen collective and even fishermen of different fishing categories on the imminent risk.

Rehabilitation actions

According to the interviewees in all the studied zones, the main rehabilitation action was the cleaning beaches (Figure 27), which deserves some considerations. The first characteristic is that the action of the shellfisherwomen was spontaneous and independent on the government measures. In many beaches in *Rías Altas*, the first affected, they were the first to clean, having only their own material of work and operating in a system of self-organization. Their only goal was to save the beaches, at that time they were not motivated by any kind of financial reward.

Another outstanding action was the solidarity, both with other shellfishing zones and with other fishing sectors. As far as the solidarity between the shellfisherwomen of different zones, prevailed the sense unity of identity. The shellfisherwomen of Z1, Z4 and Z6 worked on cleaning beaches in other zones. An interesting case was the Z1 and Z2, that in spite the opposite impact level of these zones, the shellfisherwomen converged in the same behavior offering assistance to other zones. Moreover, the Z6 registered actions of solidarity with fishermen of other sectors that were more damage than the shellfisherwomen.

Figure 27: Shellfisherwomen participating in the cleaning of beaches

Photo: EFE (2002)

6.3.5.3 Recovery

Respondents reported that the recovery phase did not correspond to a specific zone, but to all the shellfisherwomen collective. The Prestige disaster was as a catalytic event that led this collective to a new paradigm of marine conservation. In some zones it meant the beginning of new changes. However, for other zones it was the

opportunity to consolidate changes that had been initiated previously, but that for cultural and economic reasons had not been consolidated before. The recovery phase lasted approximately from 2003 to 2013 with two main actions, as shown in Table 6.10.

Table 6.10: The recovery actions carried out by the Galician shellfisherwomen in the post-Prestige disaster
Table 12: The recovery actions carried out by the Galician shellfisherwomen in the post-Prestige disaster

Phase	Actions	Specificities	Area of occurrence
Recovery	Reorganization of the shellfishing sector	The unity overcame the differences Professionalization Reorganization Strengthening the shellfisherwomen's identity Autonomy	All studied zones
	Changes in resource management	Improved resource management New conservationist awareness	All studied zones

Source: Own elaboration based on interviews

To better understand the recovery actions after that disaster, it is important to return to the period prior to 1993. Interviews and secondary sources indicate that prior to this date, shellfishing was not regulated as a profession and anyone could be a shellfisherwoman. This situation caused several tensions for women who worked regularly in fishing. In this scenario, the shellfisherwomen were not considered a group, but rivals competing with each other. As a consequence, they were not represented in the decision-making process in any sphere, such as the Fishermen's Guild or government agencies.

From 1993 to 2002 (year of the Prestige disaster), the local government, together with the shellfisherwomen, worked to regularize and unify this group into three major changes. First, recognition of the profession of shellfisherwomen with their inclusion in social security and the guarantee of basic labor rights. Second, the formation of groups, which consisted of groups of mariscadores with autonomy and decision-making power in the Fishermen's Guild and in front of the public administration. And,

finally, financial support to the *agrupaciones* by allocating funds from the newly created European Union.

However, interviewees identified that when the Prestige disaster occurred, although women had realized the importance of their profession, individualistic logic prevailed over the collectivist. This meant that the unification process of the shellfisherwomen's group had not been consolidated evenly and rapidly along the coast. Despite the efforts of government agencies and some women's leaders, in 2002 the group remained fragmented, both within the same area and between areas. It was at this time that the Prestige disaster functioned as a modifying element of the group sense.

> *"El problema es que se produce ese proceso, que después viene el Prestige, que machaca mucho yo creo que muchas cosas, y que recoloca donde ellas se sienten que poseen una profesión, se sienten valoradas, se sienten reconocidas, sienten que tienen una identidad, pero fue un proceso muy rápido."*
> Participant 14 – Researcher

> *"Bueno, es fundamental, a ver, lo que yo he encontrado es la capacidad organizativa de las mujeres es mucho mayor que la capacidad organizativa de los hombres. También es verdad que en el marisqueo hay mayor simplicidad de los procesos productivos, pero aun así yo creo que no es tanto una cuestión de simplicidad del sistema productivo como que la mujer primero, desde el año 93 en adelante, ella también se da cuenta de que la mayor parte de las asociaciones de mariscadoras son mujeres y en cierto modo que se les asigne a ellas, porque estaban ahí solicitando el derecho de acceso hay también una apropiación del espacio también. (…) Entonces tiene mayor capacidad organizativa, tienen mayor compromiso con las normas que internamente ponen, y esto también es importante porque de alguna forma eso significa que ellas internamente crean normas y reglas al margen del plan de gestión, y compromisos de respetar esas reglas que en principio pues aparentemente parece que se respeta más que las reglas que crean el sector pesquero que es de los pescadores. Entonces ven esa dependencia del ecosistema, ven lo que el ecosistema les aporta en el presente y sobretodo el ecosistema es de alguna forma un pasaporte para tener un futuro menos incierto, y por lo tanto ese grado de dependencia los hace estar culturalmente, afectivamente, emocionalmente muy vinculados al cuidado de la franja costera.*
> Participant 13 – Researcher

> *Entonces lo que son los planes de explotación se hacen todos los años en octubre, y entonces ahí fue un poco donde las mariscadoras pudimos eligir las temporadas de trabajo y tal. Entonces lo que se hizo en este momento... yo te voy a hablar*

igual de playas como de percebe, porque es más o menos igual, entonces lo que se hizo fue hacer ese plan de explotación, y en ese plan de explotación teníamos que poner las zonas, entonces lo que se hizo fue en la zona, lo que es la costa nuestra que llega hasta X, o sea, nuestra zona, entonces por ejemplo en el percebe lo que se hizo fue dividirla en cuatro partes, vale? Entonces esas cuatro partes, por ejemplo la repartimos en la zona 1 coge un trozo de la zona o sea, de esa zona la repartimos en cuatro trozos, entonces estaba abierta esa zona, entonces se iba a esa zona, entonces las otras zonas estaban descansando, entonces cuando se cerraba esta zona que estaban trabajando ahí entonces se abría la zona 2, y se trabajaba en la zona 2, bueno, eran por puntos que se conoce aquí por nombres, que son nombres típicos de aquí, por ejemplo lo que es la bióloga tiene unas coordinadas y ya sabe más o menos, pero nosotros aquí lo llevamos por nombres típicos de aquí, entonces hay una piedra que se llama la piedra de las tetas, hay una piedra... todo esto no. Entonces se abría la zona 2 y las otras ya se quedaban en descanso. Se pasaban unos meses y se abría la zona 3, y pasaban otros y se abría la cuatro. Entonces cuando se abría así por zonas, las otras se recuperaban, sabes?
Participant 9 – Shellfisherwomen

The changes occurred in five stages. First, it provoked the union of the shellfisherwomen in the entire coastal zone, favoring them to overcome some residual differences and rivalries. The second stage was professionalization. The shellfisherwomen began to seek training to improve their techniques of resources management. The training was also based on the exchange of experiences among shellfisherwomen from different areas, in order to improve the techniques developed. This collaborative network has been constantly nourished and has favored them to expand the borders, from the contact with others European and even Latin-American fisherwomen.

Third, the reorganization was another stage. Each shellfisherwomen group went through a deep process of self-criticism to evaluate what could be improved in the internal management, regarding the hierarchy and the responsibility of each member. They made changes in the democratization of the leadership position, and put into practice the idea of sharing responsibilities in all spheres of work.

The fourth stage was the strengthening of the shellfisherwomen identity, through the self-recognition and self-esteem of their work, which led them to the next stage. The fifth stage was collective autonomy. They strengthened the existing shellfisherwomen groups and created new groups with women who were associated with the Fishermen's Guild but without an own representation of their professional category. In

this way, they became a collective with total autonomy; wich has influenced the gradual increase of women leaders in the Fishermen's Guild.

As a direct consequence of the reorganization of shellfisherwomen, there were changes in the management of shellfishery resources (Figure 28, Figure 29, Figure 30, Figure 31), which can be divided into two issues verified in the interviews: improved resources management and new conservation awareness.

Figure 28: Manual selection of clams according to minimum catch size

Photo: Amanda Fadigas (2013)

Figure 29: Manual selection of *percebes* according to minimum catch size

Photo: Amanda Fadigas (2013)

Again, it is necessary to go back in the period before 1993. According to the interviewees and the secondary sources, before this time fishing had not been regulated. Predominated he culture of open access, with no quality control or quantity of extracted shellfish. In addition to this, anyone, not just the traditional shellfisherwomen, could catch shellfish at any time without control, which led the marine ecosystem to overexploitation.

Some changes in the management of shellfish resources occurred in the period 1993-2002, when the public administration regulated shellfishing. From this point the law began to establish criteria to extract the shellfish. However, local customs of open access prevailed before the law, causing many conflicts, both between shellfisherwomen from different areas and poachers. Thus, at the time of the Prestige disaster, control of catch quotas was a paradigm that had not yet been consolidated.

Interviewees reported that the catastrophe in 2002 promoted the urgency to face this problem, which is why the shellfisherwomen prompted some changes in the recovery phase. Changing the state of resource management was the main target achieved. Shellfisherwomen made a commitment to comply with the shellfishing regulation

established since 1993, in order to develop a more sustainable shellfishing model. From this goal, the management of the resources was consolidated through the Exploitation Plan, which determines a zoning of the shellfishing areas and fixes a maximum catch quota.

In addition, they established strictest standards to guarantee the quality of resources and to have more control over the sales process. Moreover, another relevant change was to increase the dialogue into the collective to ensure a more participatory decision-making process to the resource management.

Figure 30: Daily catch quota of each shellfisherwomen package and weighed

Photo: Amanda Fadigas (2013)

Figure 31: *Percebe* auction managed by the shellfisherwomen leader

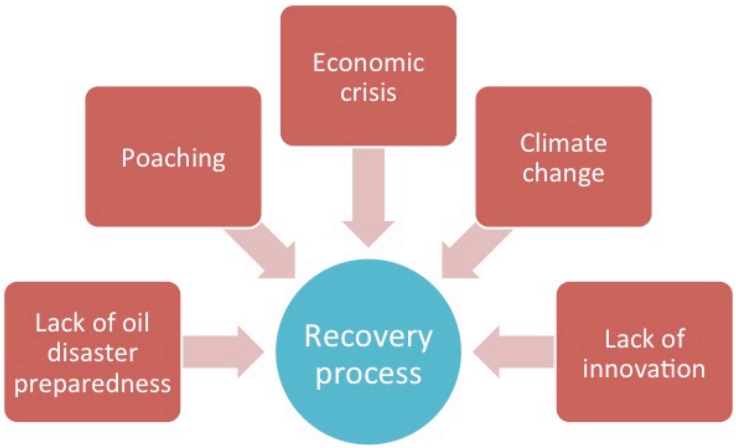
Photo: Amanda Fadigas (2013)

The second change found was the emergence of new conservationist awareness. In contrast to the earlier paradigm of open access resources, the shellfisherwomen realized that shellfish are vulnerable to oil spills and therefore can be finite. As a consequence they began to defense the idea of innovation as an indispensible strategy to extract less resource while having more profit.

Challenges faced by shellfishing in Galicia in the recovery process

In the post-Prestige disaster, shellfiserwomen have faced some challenges that have interfered in their recovery process and have put shellfishing at risk of decline (Figure 32).

Figure 32: Challenges that have interfered in the recovery process



Source: Own elaboration

In all the zones studied the shellfisherwomen reported that the recovery actions were not accompanied by preventive actions of oil disasters, neither by the public administration nor by the Fishermen's Guild. No environmental education action was registered for the perception of oil risk, no local planning or training to respond to a possible oil spill, and no oil containment barriers or cleaning tolls were identified, wich puts in evidence the lack of an emergency plan at a local level. This means that these zones still have the same pattern of preparation for oil disasters of the last decade.

> *"Nosotros no tenemos ningún curso, ninguna formación sobre contaminación. Nosotros..., nos han puesto, cursos, bueno, uno para ser percebeiro, vale, lo otro tienes curso para ser tripulante de embarcación, curso para ser patrón de embarcación, curso para ser patrón polivalente en embarcación, curso de radiotelefonista, para saber utilizar una emisora, curso de manipulador de alimentos, porque están manipulando algo que se va a comer otra persona. Tienes cursos o has tenido cursos de muy variada formación, lo que me parece bien, me parece que tan importante como es comer es que te vayas formando y aprendiendo de tu trabajo y todo lo que implique. Eh, nunca hemos tenido un curso de contaminación o catástrofes, o cómo reaccionar, o qué tener que hacer, o una tarjeta con un número de teléfono <<si tu ves chapapote en el mar llama aquí>>, que es donde te vamos... Me imagino que llamamos a 112 que está para todo! [risas]"*
>
> Participant 1 - Shellfisherwomen

In addition to the lack of preparation for oil disasters at the local level, new challenges associated with the recovery period emerged. The main factors were poaching, economic crisis, climate change and lack of innovation.

Poachers are a constant concern of shellfisherwomen in all zones studied. Firstly, poaching weakens good resource management practices, interfering with the quantity and quality of exploited resources. Secondly because it represents unfair competition, as poachers offer illegal seafood to the market at a low price. And lastly, seafood collected outside of strict environmental quality control posed risks to human health. Women have therefore devoted much effort to monitoring the coastal zone to combat this harmful practice.

The economic crisis that began in 2008 was another factor considered by the interviewees. This phenomenon is related to the macroeconomy reflected locally in three different ways. The most immediate consequence was the drop in shellfish sales, as shellfish is not considered an essential element and its price for the consumer suffered little variation. Another relevant result was caused by intermediaries; in order not to reduce their profit, the value offered by shellfish was reduced to shellfisherwomen. To mitigate this problem, shellfisherwomen have tried to resist with a strong policy of minimum price offered for shellfish in the auction and the highest quality of resource. The economic crisis also led to a sharp decline in public funding for fisheries, which was observed in the reduction of relief payments in the event of a shellfishing ban, loan or co-financing to finance equipment and tools or even investment in training for sustainable development of shellfishing

In addition to the pressure of pollution in the coastal zone, climate change was another important environmental risk for the interviewees. It has been observed that the alteration of the pluviometric regime is a threat factor for shellfishing in various ways. An example is that as this mode of fishing has a great influence of the estuarine zones, an increase of the flow of the river can drag the molluscs that are in the estuary through the flood. In the same way, a dry season increases the temperature of the water, as it modifies the nutrients available in the water.

> *"Pues, el percebe es un recurso que está en la zona intermareal, entonces nosotros trabajamos, el percebe se trabaja siempre con las marea vivas, luna llena y luna nueva, dos veces al mes normalmente, vale, un poco luego tienen que ver muchos condicionantes, el estado del mar, la climatología, las lluvias, en invierno los días son más largos o más cortos y eso tiene muchísimo que ver, la demanda del mercado, todas estas cosas. (…) Y luego también ha venido a agravar muchísimo la situación, en particular, el mal estado del tiempo. Hemos tenido un invierno muy largo y muy duro y nosotros hemos estado meses sin salir, a lo mejor un día en todo un mes, o a lo mejor otros meses dos días, ha sido un invierno terrible, terrible, de tempestades, de temporales, para la pesca en general y para el percebe en particular, que nosotros los percebeiros lógicamente somos digamos, un poco, quizás de los que más arriesgamos a la hora de la captura, y a los que más nos influye el mal estado del mar."*

Participant 2 - Shellfisherwomen

Finally, an outstanding issue identified was lack of innovation. Only the Z6 was able to develop a strategy to add value to its shellfish, turning the raw material into tinned food with a high market value. There were no other initiatives related to fisheries innovation, such as the use of digital tools for the direct sale of consumers to shellfisherwomen, which could eliminate the middleman and add value to the raw material. This study noted that there is no public policy for shellfishing with an emphasis on innovation. In the same sense, *agrupaciones* in spite of considering innovation important, usually understand that this goal should be a concern of the government and therefore did not dedicate more effort to this topic.

6.3.6. Discussion

The particularities of the resilient actions of shellfisherwomen

The resilient actions of the shellfisherwomen in the different phases of the post-Prestige show some particular elements that deserve to be understood in depth. It should be noticed that these actions were developed under the follow common characteristics: be early, self-managed and practical. They anticipated their reaction to government guidelines, taking the initiative to protect and recover their shellfishing zones.

The type of action carried out by the shellfisherwomen reinforces what literature has reported in the last years. There is increasing evidence that in a disaster context women are able to have a very proactive attitude and develop complex actions (Enarson 1998; Ganapati 2012; Hamilton and Halvorson 2007). In the experience of the Galician shellfisherwomen were registered from actions of human care to those that require physical strength. What stands out in this particular case is the prevalence of logistic actions performed throughout the different phases of the post-Prestige, when this type of actions has traditionally been associated with male agents.

Their material and human resources were used until exhaustion. In the case of their material resources, it is interesting to observe how this women group was able to take advantage of their ingenuity and creativity to use simple household utensils and low-tech work tools to create favorable strategies in the preparedness and response phases.

With regard to human resources, it stands out its undoubted organizational and communicative capacity for people management. First, they demonstrated the ability to organize a large concentration of people with different profiles (shellfisherwomen, fishermen, volunteers and entrepreneurs), and make it work. In addition, they showed

a great ability to sensitize people from a wide range, from their own family, their own collective and their colleagues in the Fishermen's Guild, to convey the importance of being proactive in this crisis situation.

The use of their local knowledge was another indispensable tool to carry out their actions. The territorial knowledge was featured by its familiarity with the different elements of the coastal territory, especially the shellfishery zones; both the formation of estuaries and tidal changes. These factors were relevant to shellfisherwomen held actions in the preparedness, rehabilitation and recovery phase. Knowledge of biodiversity was continuously applicable because they demonstrated to know the value of the marine ecosystem as a whole. However, in the recovery phase, particularly when resource management changed, they showed that their expertise in shellfishery was essential in helping to restore the fragile coastal environment over the last decade in the post-Prestige.

Finally, the last particularity addresses unity and intra-group solidarity. The data suggest that they developed a very clear conviction about the sisterhood within the collective, which includes care and responsibility among each other. In their actions it is possible to observe that independently of their area of origin they are perceived as a single collective. This element is a key to understanding the resilience of these women, as it reveals their great capacity to overcome past conflicts to achieve the same target that benefits the entire marine socio-environmental system.

Motivating factors of resilient actions of shellfisherwomen

Some motivating factors may have contributed to the resilient actions carried out by the shellfisherwomen in the post-Prestige. First, there are the socio-economic and gender factors. In the Galicia coastal zone, shellfishery is one of the few jobs in which women can earn a salary while they can reconcile family care. This element became relevant since in these zones women are the mainly responsible for caring for family members, which limits their alternatives in the labor market.

Moreover, the recognition of shellfishery as a professional work was a recent achievement (1990s). Prior to this, the shellfisherwomen were only poor women, marginalized within the male fishing universe, with no decision-making power or rights. The impact of the Prestige disaster allowed these women to realize that they could have abruptly lost their identity as shellfisherwomen, what could mean a loss of a great conquer. This was reflected in a greater sense of pride in what they had become and in the awareness of the progress made in the professionalization of this work. Therefore, the data suggest that these factors led them to defend their status.

The second group of factors is related to socio-environmental and ethical issues. Shellfisherwomen perform a productive labor, mainly developed by women and highly linked to the environment. These characteristics bring also some subjective implications. They have been emotional and cultural related to the marine environment for generations, which contributes to a non-strictly utilitarian view of nature. This factor seems be directly related to its widespread conservation concern, which could explain much of its resilient actions in the different phases of the Post-Prestige.

In another aspect, the fact that shellfishery is mostly a female work adds a distinctive view on the motivations of shellfisherwomen to make those resilient actions. The results suggest that they knew how to transform their life experience and vulnerability into a driving force to protect spheres that were at risk in the post-Prestige: shellfisherwomen as whole, marine environment, fishermen and volunteers. By looking at the Prestige disaster through the ethics of care, these women were able to overcome their old conflicts and then build bridges to empathy, respect, sisterhood and solidarity, which in the long-term have benefited them to meet the commitment to more sustainable shellfishery and cooperative work.

The invisibility of shellfisherwomen in resilient actions

In spite of all the actions carried out by shellfisherwomen throughout the different phases of the post-Prestige, they were not a visible stakeholder. It is important to note that these women were minority represented and had their actions little recognized in all secondary sources of research; but also in primary sources, mainly in the interviews of the nongovernmental agents. The only actions reported in these sources were to cook food and ensure the health of the volunteers both in the relief phase and clean beaches in the rehabilitation phase.

Among the interviewed shellfisherwomen, it is noted that they knew to report all their actions in the post-Prestige; however, their speech often underestimated the scope of their actions. This suggests that they did not realize the real dimension of their contributions to overcoming the Prestige impacts on the coastal zone. As for the researchers interviews, although they did not know all the actions developed by the shellfisherwomen, these experts acknowledged their relevance in the post-Prestige, in addition to denouncing the invisibility of these women in the resilience process.

Some scholars have observed the invisibility of women in resilient actions (Childs 2006; Enarson 1998; Scharffscher 2011). In the case of the Galician shellfisherwomen in the post-Prestige, some elements could explain this phenomenon. Firstly, especially in the

preparedness and response phases, the shellfisherwomen were not identified as an identity group of their own, but as part of the Fishermen's Guild, governed mostly by fishermen. Then, much of the action taken by shellfisherwomen in all resilient phases was done indoors, and most of the visual record of a disaster is done outdoors, especially in the case of an oil spill.

However, one issue that deserves to be approached carefully is what is considered to be women's work in the public sphere of a disaster context. Considering the Enarson's (2000) classification for women labor on the disaster resilience, the Galician shellfisherwomen had developed two of these categories during post-Prestige: community and productive work.

In the community work, it is possible identify two significant situations: when the shellfisherwomen executed care and strategies actions. The care actions were performed in the public sphere and attended people who did not belong mainly to the familiar nucleus of the shellfisherwomen. Despite this, these actions were considered by the shellfisherwomen themselves as an obligation on them only because they are women, while external agents considered it a minor task, so that this issue deserved no further consideration on the part of the interviewees and the public opinion.

In the other hand, strategic actions were also not recognized as relevant to the coastal resilience throughout the post-Prestige period. The data suggest that the fact that shellfisherwomen were not consolidated as a strong stakeholder with decision-power could have influenced their representativeness. A clear case occurred in the preparedness phase; in which three studied zones had serious communication problems with government to get the barriers to protect their areas at risk. These factors silenced the women voices in front of the public opinion (Bru-Bistuer 1997).

Concerning the productive work, a remarkable fact was the great effort made by the shellfisherwomen to recover the productivity of the estuaries, which reinforces the findings of some scholars (Frangoudes, Marugán-Pintos and Pascual-Fernández 2008; Marugán-Pintos 2004; Marugán-Pintos 2012). The way in which they lead this situation is very particular, because they did not reduce their action to return to work. Instead, they have faced a profound process of change, both into the collective itself and in the resources management.

However, these actions were carried out over the long-term, what could have been dissociated from the perception that these are consequences of the shellfisherwomen's resilient capacity to overcome the Prestige impacts. As a result, what should be recognized as evidence of the socio-environmental maturity of these women became invisible in the historical records of the Prestige disaster.

The resilience period is a process that can last 10 years or more (Alexander 2009). To some extent, shellfisherwomen achieved the stability of the sector due to their reorganization and changes in resource management. Thus, they have maintained their profession over time and have preserved the sustainability of marine resources. However, it is important to consider the challenges shellfisherwomen have faced in the last decade to understand their limitations in the resilience process. Therefore it is not possible to affirm that it was a total recovery, but taking into account what was in the scope of shellfisherwomen, have developed a great capacity of resilience.

6.3.7 Conclusions

This paper adds original information on the contributions of the Galician shellfisherwomen to safeguard the coastal zone after the Prestige oil spill, in Spain, 2002. It was identified the resilient actions performed by them in the different phases of the post-Prestige disaster: preparedness, response and recovery.

The preparedness phase showed that the actions of shellfisherwomen were not enough to avoid the damage to the coast, mainly due to the lack of adequate tools at the right time. However, in the absence of mitigation measures, they contributed to reduce the impact on some shellfishing zones. Their performance was characterized by a spontaneous initiative, independent of the government's guidelines.

In the response phase, the shellfisherwomen actions proved to be very effective. Relief actions were important in maintaining a minimum infrastructure that could attend the people involved in the response, as well as contributing to social cohesion during this phase. On the other hand, rehabilitation actions were indispensable for the restoration of beaches. Thanks to the solidarity established between them, they were able to cover a greater number of shellfishery zones.

The shellfisherwomen obtained a great result in the recovery phase, starting from a complex process that focused on the unification of the collective and its exponential rating. Therefore, they achieved a clear understanding of the marine system limitations, and straightened their commitment to the shellfishery zones conservancy and sustainable resources management.

Two main conclusions emerged from the analysis of the shellfisherwomen resilient actions. The following are recommendations to increase their resilience to the risk of a new oil spill disaster, what could also be applicable to other sources of permanent pollution in the coastal zone.

Firstly, the shellfisherwomen resilient actions were indispensable to the conservancy of the shellfishery zones, thus benefiting the entire Galician coastal area. Any other collective or technical staff could not replace the knowledge, social skills and commitment of these women to achieve this goal. This reinforces the idea that the disaster response committee should ensure the direct participation of vulnerable groups in decision-making.

Second, shellfisherwomen left an important ethical and environmental legacy, based on the values, priorities and *modus operandi* that guided their resilient actions. Specifically in this case, it highlights the continuity of this legacy and the various spheres it encompasses. This evidences that women and the ecological system managed by them can be highly resilient due to the predominance of the principles they nurture.

Based on the findings, this study recommends some guidelines to achieve more effective resilient measures, being more appropriate a joint implementation between government agencies, non-governmental agencies and local stakeholders.

The representativeness of shellfisherwomen could be key to reducing the impact of an oil spill on an often invisible social-environment system, such as shellfishery. Commonly, the decisions made by the disaster response committee are generic and homogeneous. The complexity of the social-environmental systems tends to disappear, and the response does not include some of the most vulnerable groups. Therefore, the National Response System for Marine Pollution, and the Territorial Plan of Contingencies for Accidental Marine Pollution of the Autonomous Community of Galicia should include mechanisms of direct participation, allowing the contribution of local experts. However, the participation must assure the equity of peers, avoiding to hide the shellfisherwomen within the fishing collective.

Moreover, shellfisherwomen should maintain independent actions that could collaborate to the shellfishing zones protection in the event of an oil spill. To achieve this objective, this issue must first be incorporated into its agenda, based on a process of self-awareness of its performance in the Prestige disaster and sensitization of the shellfishery collective. Thereafter, they could raise funds for the training and purchase of anti-pollution material resources. Both European Union funds for the fishing community, as well as environmental foundations, could be interesting in finance actions to the marine conservancy. This measure could contribute to maintain the principles developed by the shellfisherwomen in their response to the Prestige disaster, as well as ensuring minimal protective action on shellfishing zones.

To conclude, the study carried out in this paper brings new perspectives on the post-Prestige disaster and revels the important role played by the shellfisherwomen to restore the Galician coastal zone. In addition, it contributes to the expansion of multidisciplinary research on disaster resilience, environment and gender issues, as it shows that women's groups can offer important elements of resilience that must be included in the solution of the disasters.

7. Discussion

Figure 33: Selected shellfish (in the foreground) and shellfisherwomen waiting to selected their daily quota according to the minimum size (in the background)

Subchapters 6.1, **6.2** and **6.3** have been devoted to presenting the results of the research from the analytical categories of vulnerability, impacts and resilience. However, these results are not isolated, but dialogue with each other through a very clear sequence. In the first place, the previous conditions of vulnerability of shellfisherwomen and the Galician coast were verified in the face of an oil disaster. Following, it was identified how the Prestige spill effectively affected the socio-ecological system of shellfishing. Finaly, it was demonstrated how the shellfisherwomen have faced this disaster since it happened until the Prestige +15.

Next, the main connection points between each subchapter will be discussed, providing answers to the research questions.

7.1 Shellfisherwomen: the forgotten stakeholders in the Prestige disaster

Women's invisibility in disaster studies has been demonstrated again and again in both natural and technological disasters worldwide (Işık et al., 2015, Nakhaei et al., 2015, Saito 2014, Spindler, Elkit and Christiansen , 2010). There is still a large gap in literature in terms of the consequences of a disaster for women's groups. Furthermore, the way in which women traditionally are represented in this field of research have not been overcome: either as victims or reduced to a simple dichotomous "female" variable (Childs, Enarson 1998, Fordham 1998, Fothergill, 1999, Seager 2006). This view on women's groups is a trend that has prevailed in the studies carried out over the past decade on the Prestige disaster.

The literature on the consequences of the Prestige catastrophe considers fishing as a homogeneous activity that is usually related to the work of a male fisherman (García-Negro, Vilasante and Carbalho Penela 2007, Garza-Gil, Prada-Blanco and Vázquez-Rodríguez 2006, Surís-Regueiro, Garza-Gil and Varela-Lafuente 2007). This was the main individual representing the fishing communities in the studies on damage caused by the Prestige spill. The lack of representativeness of women in this context, the lack of awareness of their activity, or even the lack of awareness of their contribution to Galician fishing communities, meant that shellfisherwomen were not studied as a group exposed to the Prestige, making them invisible or superficially represented.

The history of the Galician shellfisherwomen shows that this social group has evolved through a long process of combating its invisibility in the public sphere. The professional regularization of shellfishing since 1995 was an important step towards the recognition of the fundamental rights of these fishery professionals in the Galician coastal zone (García-Negro and Zotes-Tarrio, Marugán-Pintos 2004; Marugán-Pintos 2012). However, the Prestige oil disaster demonstrated that the formal recognition of women as workers was not able to avoid other dimensions of invisibility that expose

them to socio-environmental risks. The gender analysis of this disaster showed that the lack of recognition of women shellfisherwomen as stakeholder in this environmental conflict had a direct implication in the consequences of the oil spill to this group of women.

Therefore, the first stage in understanding this process was to address the main characteristics of shellfisherwomen's work. Through the results of **Subchapter 6.1** the phenomenon of feminization of this profession and its origin in gender roles in coastal communities could be observed, a phenomenon quite common in the coastal zones of the world (Bennet 2005, Davis and Gerrard 2000, Fadigas and Garcia 2012, Göncüoğlu and Ünal 2011, Hauzer, Dearden and Murray 2013b, Munk-Madsen 2000, Weeratunge, Snyder and Sze 2010, Zhao et al., 2013). In addition, in the Galician case, feminization extends beyond beaches, affecting mainly the local productive chain of shellfish, through the canning industry. Also, the maintenance and transmission of knowledge about artisanal cultivation and the extraction of shellfish through generations was carefully reported, reinforcing the role of women as environmental managers.

This group develops a relevant activity that includes women in the labor market. In addition, shellfish has a cultural and environmental importance that highlights Galicia as the main shellfish artisanal producer in Spain. These elements characterized the shellfisherwomen as a relevant agent for sustainable fisheries, through their contributions to the balance of the socio-ecological system on the Galician coast. However, this was not enough to guarantee them a place in the decision process, a situation commonly repeated in other coastal scenarios (Anugwom and Anugwom, Evans, Gebbels and Stockill, 2008).

Subchapter 6.1 also showed that since the pre-Prestige period shellfisherwomen had weak decision-making power and were far from the relevant positions in the dialogue with public institutions. They are women who develop a significant productive activity in the public sphere, but still it is seen as a secondary activity, both for their families, the Fishermen's Guild and the government. This led to shellfisherwomen not being sufficiently represented at any stage of the Prestige disaster.

Their vulnerability factors revealed original information about the high risk of marginalization encountered during the Prestige disaster. Individual, collective and territorial identity were elements of risk with a subjective importance for women. But the Prestige also put at risk elements involving material damage, such as the marine environment or the lack of employment opportunities for them. Given the scenario of pollution pressure on the Galician coast, the most ncongruous vulnerability factor was the absolute lack of legal protection of these areas. It is not possible to guarantee the

existence of a shellfisherwoman if her livelihood and environment are not protected and she has no decision power on this.

If the vulnerability factors are observed, it is possible to state that the drastic impacts suffered by women after the Prestige disaster could already be expected. This is because the problems caused by the oil spill had begun long before the accident, which obviously worsened with disaster management and the exclusion of shellfisherwomen from the decisions made.

Subchapter 6.2 showed serious damage, such as the expansion of areas exposed to the oil spill or mismanagement of relief payments, which could have been avoided or mitigated if shellfisherwomen had the right to be consulted in contingency actions. The absence of shellfisherwomen in the decision-making process indicates the lack of recognition of these women as political agents. It was devalued their expert knowledge of the environment and the surrounding community, and his ability to contribute with their vision about the local reality. The inclusion of local knowledge associated with the specific knowledge of women has been advocated as a relevant tool in disaster risk reduction, and the experience of the Galician shellfisherwomen validates this need (Reichhel et al. and Frömming 2014, Shepherd and Williams 2014, de Silva and Jayathilaka 2014, Tran et al., 2009).

The perception of imminent and future risk generated an awareness of its danger to the fishing community. **Subchapter 6.3** suggests that shellfisherwomen noted the difficulties in continuing their productive work after the devastation of the marine environment. Its main objective was to protect traditional knowledge, its autonomy and personal satisfaction. These factors contributed to the fact that shellfisherwomen adopted their own resilience strategies, which explains spontaneous, independent and immediate actions. This profile of women in the actions of resilience is still little known, however it has already been demonstrated by some scholars (Ajibade, McBean and Bezner-Kerr 2013, Gordon 2013, Işık et al 2015, James and Lin 2015, Lilley and Slonim 2016, Silva and Jayathilaka, 2014).

The scope of shellfisherwomen's action in the period of resilience indicated not only the absence of the State and the importance of civil society in a disaster context. It also showed how the shellfisherwomen's role in regaining fishing territory was completely hidden behind the image of the Fishermen's Guild. The main consequences of its invisibility are to deny its role, to underestimate the importance of the participation of heterogeneous groups in the management of disasters, and to reduce the possibility of making decisions solving damages caused in a complex reality.

The results indicate that the debate on the representativeness of women needs to progress. Their participation in disaster contexts must be recognized as a right. While their participation is conditional on free choice or approval by the government, they will continue to be at risk of not being represented.

There are still other variables that could exclude women from disaster management. The first is the political-partisan factor. Each government creates, interprets and applies laws taking into account its own understanding of what is participation and who has the legitimacy to engage in participatory processes. In this sense, in a catastrophe scenario, the participation of women becomes susceptible to political decisions, which can lead to conflicts between the government and the group of women affected.

The other factor that could influence non-participation of women's groups is the type of disaster, especially in the context of technological disaster, such as the oil spill. In this case, in addition to civil society and government, there are third agents involved, which are the companies or industries responsible for damages.

The complex interrelationships between oil companies and transport companies lead them to operate in obscure ways, such as the use of ships with flags of convenience that do not respect safety and environmental laws. Therefore, the economic power of these agents, added to the international legal loopholes that concern maritime transport are important factors to consider (Adusah-Karikari, 2015, Balasubramaniam, Bouyle and Voulvoulis 2007). That is why it is so important to ensure the participation of women through legal mechanisms.

Currently, the National Response System for Marine Pollution and the Territorial Plan of Contingencies for Accidental Marine Pollution of the Autonomous Community of Galicia do not offer any type of participatory mechanism for the affected populations, not even the fishing community. This means that there is a long way to achieve legal and political means to ensure the shellfisherwomen's participation.

It is important to keep in mind that legal and political mechanisms are a necessary support, but they are not a definitive way to include and maintain the presence of shellfisherwomen in the decision-making process, because laws and policies can be changed. It is therefore essential to strengthen groups of shellfisherwomen and increase their awareness of the relevant role they play in shellfish territory conservation. Consequently, they would be better able to question the infallibility of the State and its decisions (Balasubramaniam, Bouyle and Voulvoulis, 2007, Karl, Olivieri and Floriti, 1996, Thurairajah and Baldry, 2010).

7.2 Lack of priority to protect shellfishing zones

Artisanal fisheries are strictly dependent on coastal environmental balance. In this context, shellfishing is in a special condition of vulnerability. Unlike other categories of fisheries, shellfishing depends on a very specific marine territory, usually composed of beaches, rocky areas or mangroves. The pressure on this coastal scenario has increased exponentially, caused mainly by several sources of pollution and the coastal occupation of other productive activities, such as tourism or the housing sector (Wilson and Wiber 2009).

This trend has increased socio-environmental conflicts in coastal areas around the world, and shellfisherwomen are a group at risk in this regard. This raises the need to discuss the effects of catastrophic events on shellfishing zones as well as to understand the symbiotic relationship between shellfisherwomen and the coastal zone.

The marine biodiversity of the Galician coastal zone is featured by its richness that serves a wide range of fisheries, including shellfishing. The variety and quality of the autochthon shellfish is a reflection of the particular characteristics of the Galician estuaries, differentiated by the *Rías Altas* and *Rías Baixas*. The favorable biogeographic conditions found by shellfisherwomen in these zones make them unique and irreplaceable to shellfishing. It is this peculiarity that determines the environmental relevance of Galician coast to shellfisherwomen.

At the same time as shellfishing is benefited by the marine environmental, it benefits from the artisanal practices of shellfisherwomen. **Subchapter 6.1** shows that Galician shellfisherwomen contribute to marine conservancy through the use of minimally invasive techniques transmitted over generations. Their continuous presence on the beaches generates a deep knowledge of the ecological system, which allowed them to observe the mismanagement of the resources and to know the pressures suffered in the zone. Thus, shellfisherwomen assessed that the state of the marine environment prior to the Prestige disaster was fragile due to over-exploitation of resources and pollution.

This data is relevant because they favor a comparative analysis of the Prestige's impacts considering the previous and subsequent period. In this regard, the **Subchapter 6.2** provides new information on the oil impacts on the area. Although this issue has been reported in the literature (Bernabeu et al. 2009; Bernabeu et al. 2013), there was insufficient data on the shellfishing zones and their specificities. The results presented in **Subchapter 6.2** indicate that the authorities did not consider the productive and environmental value of the shellfishing zones both in the *Rías Altas* and *Rías Baixas*, which led to direct consequences of several orders.

The large exposed area and the high content of oil pollution caused a great impact on the shellfish commercialization. Therefore relief payments functioned as a buffer to reduce the economic impact of the shellfishing ban. Although the payments did not follow a fair pattern, considering the proportionality of the damage in each zone, for the shellfisherwomen was an important relief because collaborated to maintain a minimum economic security.

However, one of the major lessons learned from this experience is that compensations does not meet the needs of all agents, does not recover all the damages, and can contribute to creating new problems, such as lack of risk perception or environmental awareness, which is also a phenomenon still little studied (García-Negro, Villasante and Carballo Penela 2007; Loureiro, Loomis and Vázquez 2009).

Another point of the Prestige impacts that deserves more attention is the result of the shellfishing ban for the sales market and the processing industry. Some zones were submitted up to 12 months of closure, a long period to ban shellfishing. Considering mainly that the disaster occurred near the Christmas Holidays (in December), the better period for the sale of seafood in Spain, the lack of local shellfishing led the wholesale trade to seek this resource in external zones, even in countries with prices more competitive. This fact could have provoked a dangerous precedent to the Galician shellfisherwomen, creating a pernicious dynamics that plunges the price of shellfish, putting local production at risk. In fact, one of the current problems of shellfisherwomen is the low price paid for their resources in wholesale trade. This issue also corresponds to the threat of poachers, who offer illegal shellfish sold at a bargain price (MAGRAMA 2016).

The **Subchapter 6.2** also contributes to the shellfisherwomen's perception of scarcity and disappearance of some marine resources. As it was presented in the mentioned chapter, no institution carried out an exhaustive monitoring of the zone that can confirm the perception of these women. However, there are some studies suggesting significant changes in the marine fauna (Abad et al. 2010; Bernabeu et al. 2009; Bernabeu et al. 2013; Izagirre et al. 2014; Junoy et al. 2013; Marigómez et al. 2013). Thus, the perception of shellfisherwomen, as a part of the local knowledge, should be considered at least as an evidence of changes in marine environment. This perspective on the local knowledge in disasters events has been accepted in different contexts, due to it presents another way to evaluate and reduce the impacts (Gaillard and Mercer 2012; Hiwasaki et al. 2014; Shepherd and Williams 2014; Syafwina 2014; Tran et al. 2009).

Moreover, the slow resilience process of some shellfishing zones presented in **Subchapter 6.2** could be related to the previous state of fragility of the marine environment in the period before the Prestige disaster, such was identified in **Subchapter 6.1**. This exposes the need of maintain the coastal zone in a high level of conservancy to potentialize its recovery capacity. There is a direct relation, the greater the state of conservation of the zone, the greater its capacity of recovery, due to the environment is working in its optimal level (Arata et al. 2000):

Conservancy ➔ Recovery Capacity

Subchapter 6.2 showed the increase of zones classified as C, what is another indicator that the protection of shellfishing zones was not priorized. In this sense, more shellfish must be purified in treatment plants provoking, among other consequences, a fall in the price paid for this resource to shellfisherwomen (MAGRAMA 2016).

Subchapter 6.3 suggests that shellfisherwomen have assumed with few suport the environmental risk, without a partnenship with government towards a conservancy public policy, what is expected in post-disaster events (Imperiale and Vanclay 2016; De Silva and Jayathilaka 2014). First of all, in the preparedness and response phases, the slow reaction of the government endangered the natural heritage of the zones, and in this sense, the shellfisherwomen did the best actions as possible to protect the coastal zone. Already in the long-term of recovery, it can be seen the concern of shellfisherwomen for generate favorable conditions to perpetuate shellfishing on futures generations. They initiated an unprecedented movement in fishing communities towards a sustainable shellfishing, based on their commitment with the group and the environment. Add to this, the challenges currently faced by them have been majorly palliated by the own shellfisherwomen, requiring a more assertive action from government in order to endure since local problems, such as poaching, from global problems, like climate change.

Finally, the **Subchapter 6.3** contributes with a particular data about resilient actions of women's group in a disaster context. In the experience of the Galician shellfisherwomen, it was observed that the integrity of their livelihood was threatned. This fact had a direct implication in the numerous actions classified as productive and community labor. These actions were of great importance for the restoration of the marine environment, which mitigated the lack of a decisive governamental action to protect the shellfishing zones. Thus, this case study reinforces the argument of the feminist environmentalism, in which the link of women with environment is rooted in their struggle for survival, and despite they have suffered the environmental degradation in quite gender-specific ways, they are one of the main change agents to protect and regenerate their environment (Agarwal 1992).

7.3 Toward a safer coastal area in Galicia: lessons learned from the experience of Galician shellfisherwomen

Recovering a damaged environment is a long process that depends on social, economic, cultural, political and ecological factors that have influenced the decisions made. Disasters go through different cycles. First, it passes for an intensive period of overexposure by the media, when there is great social sensitivity regard the damage occurred and a certain interest from the responsible authorities to solve the problems. But, following it comes a period of oblivion: of the damages, the victms and the commitment to recover the damaged socio-environmental system. At this point a long-term analysis becomes relevant, because it allows to assess if there have been changes contributing to reduce the risk of new disasters (Cutter, Tiefenbacher and Solecki 1994; Blaikie et al. 1994).

In this context, some scholars argue that the change to environmental risk reduction must be a process beyond bureaucratic decisions and technological measures. Inserting the socio-gender-environmental perspective could be the key to achieving greater environmental balance in many contexts. Women's groups are influential agents at the private and community level; therefore their participation in the decision-making process involving disaster risk reduction must be on the agenda of governments, institutions and also in local communities (Cutter, Tiefenbacher and Solecki 1994; Enarson 1998).

The study of the Prestige catastrophe, from the previous period to the present, allowed an in-depth understanding of the shellfisherwomen's experience in the event of the oil spill. Observing at the vulnerability conditions presented in **Subchapter 6.1** and the resilient process in **Subchapter 6.3**, it is possible to discuss in what respects progress has been made in the protection of shellfishing zones and what the role of shellfisherwomen might be for the future sustainability of estuarine zones.

In the last decade, the Galician coastal zone did not register any relevant oil spill disaster. However, there is no guarantee that no new accidents will occur because of the global and intensive dependence on fossil fuels in the contemporary world, added to the lack of safety in maritime transport, since there are still ships with flags of convenience (Llinás Negret 2016; Chen et al. 2017). To this it is added that the pressure of other polluting sources is permanently present in this zone.

As shown in **Subchapter 6.2**, it is increasing the amount of zones classified as Zone C, while it is decreasing the shellfishing zones classified as zone A. Despite the advances in the resilient actions, more than ten years after the Prestige disaster the number of shellfisherwomen has reduced in almost half. Of 8,286 people involved in shellfishing

in 2001 (IGE 2001), the year before the Prestige, nowadays there are only 3,799 people working in shellfishing (IGE 2016).

Data on the pressures on the coastal zone of Galicia in the last fifteen years, the increase of Zones C and the reduction of the official quantity of shellfisherwomen give us strong evidence that these factors may be related. This is a relevant contribution of this work, as it proposes a hypothesis for future research on the imbalance of the socio-ecological system of shellfishing. It is should be noted that despite the seriousness of these facts, they have not been studied until now. It seems that this is not considered a socio-environmental problem that deserves more attention. Changing the perception on this issue would restore the environmental balance of the shellfishing zones, and, consequently, the social balance to shellfisherwomen in this region.

Where it can be considered that there were some changes was in the legal and administrative area. Access to information, although not guaranteed as a fundamental right in Spain, had a first advance when the Law on Transparency of Spain number 19/2013 was promulgated (España 2013), and it is applicable throughout the public sphere, including in the environment. Moreover, ten years after the Prestige disaster, Spain finally approved common guidelines for responding to an oil spill in coastal areas through the National Response System for Marine Pollution. And, recently in 2016, Galicia approved the Territorial Plan of Contingencies for Accidental Marine Pollution of the Autonomous Community of Galicia.

However, as emphasized in **Subchapter 6.3**, both national and autonomous systems do not have direct participation mechanisms; all decisions are reserved primarily for the government and its institutions. Also, no training in oil spill prevention and response was recorded in the field to protect the shellfishing zones along the coast, suggesting that this has contributed to a widespread lack of risk perception at present.

Some vulnerability factors presented in **Subchapter 6.1** were underestimated or are still in the process of change, despite more than a decade since the disaster. This represents a major obstacle to the protection of shellfishing zones from coastal pollution, revealing that little progress has been made in reducing the vulnerability of this socio-ecological system. Furthermore, the changes made so far at the government level have shown that the choice not to include civil society and local communities in disaster management was conscious, although these groups have proved to be indispensable in responding to the Prestige disaster.

Some authors (Blaikie et al 1994; Haddow, Bullock and Coppola 2007) argue that the State should be responsible for disaster management, and, in the case of technological disasters, the company that caused the damages must also respond. However, the inclusion of other stakeholders has been shown not only as necessary, but also as effective in many experiences, such as the case of the Galician shellfisherwomen, who were largely responsible for saving their own shellfishing zones, in addition to contribute to the coastal zone as a whole.

After all, it is essential to discuss the real progress made over the last decade. It is possible to see in **Subchapter 6.3** that the great changes were made at the local level, specifically by shellfisherwomen. They have made significant progress in strengthening the group through the great process of empowerment, which helped them to take a more decisive action in the various phases of the post-Prestige.

Furthermore, a fundamental advance was the improvement of the management of the shellfish resources. Compared with the previous management model, it is notable that shellfisherwomen have moved towards a more sustainable model based on several subjective factors, such as responsibility, cooperation, commitment and respect to the environmental ethic. Some studies have demonstrated the importance of applying these values to resilience to disaster due to the favorable consequences they bring to socio-environmental balance (Ajibade, McBean and Bezner-Kerr 2013; Carpenter 2015; Cutter, Ash and Emrich 2014; Kwow et al. 2016).

8. Conclusions

Figure 34: Shellfisherwomen gathering during the high tide

If there was a common element in shellfisherwomen's discourse, this was the emphasis on the relevance of the sea in their lives. The sea as a generous entity that, despite pressure of the human actions, always has something to offer those people who depend on it. The sea is the mother of the fishing communities.

One of the major problems identified by them was the unsustainable practices of overexploitation and the lack of ethical behavior among peers. In this sense, the Prestige disaster left a first apprenticeship: the socio-ecological system of the shellfishing is vulnerable. They realized that environmental degradation and its effects on marine resources could be prolonged over time, thus threatening a significant part of themselves and their way of life. Therefore it was necessary to change the own shellfisherwomen to recover the area.

The paradigm in which the Galician shellfisherwomen were totally marginalized into the fishing universe has changed. Nowadays, in comparison with the previous Prestige period, they are a stronger group; more visible as fisherwomen at local, regional, national and even international level; and they hold more leadership positions in the Fishermen's Guild. As a group of women in fishery, they have achieved a highly professional management of resources, with few precedents in the fishing universe.

Moreover, they overcame some barriers related to traditional reproductive roles. On the one hand, as they became more autonomous at work, this was reflected in the private sphere; in other respects the new generations may have a more advanced welfare estate than they did 40 years ago, allowing them to be more independent of some care labors. But it also interesting to see that these caretakers roles were re-signified by them, from the moment that they developed a systemic view of fishing, in which everyone depends of the sea, so it is essential to be ethical one with the other.

This thesis, however, showed evidence that the strengthening of the shellfisherwomen collective and improved management of marine resources were not followed by concrete measures for marine conservancy, which could have benefited the balance of shellfishing zones. This suggests a direct implication in the decline of shellfishing, both in the production and in the quantity of people who work in it.

The study indicated that the Prestige oil spill, coupled with strong pressure from other sources of pollutants, might be related to the decline and disappearance of shellfishing resources, and to the increase of zones classified as C, means being closed for fishing because of high pollution.

These problems could be minimized if there were a greater connection between shellfishing management and concern about the conservation of the marine environment. Add to this, more restrict laws about general pollution must be developed. It is important to observe that in the public administration at any level both issues are covered from different departments, and this makes it more difficult to combat pollution in the shellfishing zones.

This demonstrates why shellfishing management has improved, but no progress is being made towards more consistent results. Pollution was not raised as a priority issue for the proper functioning of shellfishing. It is therefore imperative to accredit shellfisherwomen as environmental managers in shellfishing zones, with the right of decision-making power in government bodies dedicated to coastal conservancy, pollution reduction and response to oil disasters.

It is therefore concluded that the conservation of shellfishing areas was not prioritized, which increased the effects of the Prestige disaster and the pressures of other sources of pollution on shellfishing resources. Therefore, the Galician shellfisherwomen must be included in the coastal management to collaborate in the reduction of the pollution that, consequently, has maintained them in condition of vulnerability.

8.1 Recommendations

Based on the conclusions presented, this study proposes some recommendations to be applied, in order to improve the quality of the shellfishing zones and reduce the vulnerability of the Galician shellfisherwomen:

- The first step towards change is an internal process of reflection within the shellfisherwomen collective. The Prestige disaster must be reviewed by them to discuss their role in this crisis and to assess the relevance given by the government over the last decade to the protection of shellfishing zones. Through this analysis, they could assess the vulnerability condition they face today. The results of this research, in the form of a report to shellfisherwomen leaders, could contribute to the initiation of the internal discussion. In a way, the shellfisherwomen participating in this study suspected that the Prestige disaster was related to the current vulnerable status of shellfishing, however they sought a more general view of the context, which is what this study can collaborate to.

- Local and national meetings of shellfisherwomen often focus on issues related to labor rights, owing to their historical marginal situation in the fishing universe. Although this agenda is extremely relevant to overcome the inequalities, it is necessary to open the dialogue to the environmental issues that are affecting shellfishing. Pollution of coastal zones is actually one of the

most important threats to their activities, and this problem must be addressed. It is essential to consider that shellfishing is much more than a productive activity. First, because it is strictly linked to the environment, and furthermore there are many values that also need to be preserved, such as the issue of identity. To strengthen this discussion, institutions and associations on the fisherwomen's rights in Spain could be important stakeholders in supporting local associations of shellfisherwomen to promote this debate in the face of government institutions, such as the National Association of Women of Fisheries or the Spanish Network of Women in the Fishing Sector. Also, the establishment of a joint committee between fishermen and shellfisherwomen in the Fishermen's Guild to address issues of disaster prevention and management would open up a decision-making space to deal with coastal pollution.

- From the analysis of the actions of resilience it was observed that the shellfisherwomen recognize their powerlessness to face the subject of coastal pollution. Due to the barriers to communicating with government in the Prestige disaster and other episodes of less known contaminants, they realize their lack of representativeness. Therefore, a significant strategy would be to create a partnership between shellfisherwomen and non-governmental environmental organizations, which could support them to make this problem visible. This collaboration between the environmental sector and women in fishery could certainly empower them as environmental managers. This type of experience has been successful in other coastal contexts, such as the partnership between Conservation International and Brazilian fishing communities.

- The economic, social, cultural and landscape relevance of shellfishing should be included in the agenda of the Spanish and Galician governments. Shellfishing should be considered as an activity at risk of extinction due to high pollution in the coastal zone. In this case it would be better to create a joint committee composed of government bodies from the environmental and fishing sectors, and shellfisherwomen leaders from all shellfishing areas to apply strategies to combat marine pollution

- To reduce pollution in shellfishing zones and maintain better water quality, the main recommended action is to strengthen treatment plants to reduce effluent from wastewater and aquaculture waste. The possible processes for recovering nutrients in water and reducing environmental degradation, especially in estuaries, are tertiary treatment, with plants (phytoremediation) or biolfim

(bioremediation). Add to this, it is also necessary to create mechanisms to the local stakeholders that can facilitate reporting the presence of polluting sources on the coast.

- Currently there are a number of legal mechanisms that establish control of coastal zone pollution, which implies directly or indirectly consequences for the Galician coast. However, these mechanisms do not ensure any access to the direct participation of shellfisherwomen decisions affecting the conservation of shellfishing zones. In this research, shellfisherwomen have demonstrate sufficient knowledge to contribute to the management of an oil spill or other polluting source in the coastal zone, specially when their shellfishing zones are at risk. That is why it is so relevant to guarantee their participation as legal representatives of these zones in the decision-making process involving polluting events.

- Another indispensible measure is the reduction of impunity for polluters. The condemnatory sentence of the Prestige showed the high level of impunity, provoking the outrage of those affected in Galicia (see **Chapter 10**). But it is also important to highlight the impunity of the various environmental crimes often caused by the permanent contaminating sources that press the Galician coastal zone. In this sense, the vigilant conduct of civil society must be continuous to force the government to comply with the laws. Therefore, environmental education campaigns, as well as access to information and transparency in the punitive process are relevant instruments to the citizenship.

- It is recommended to strengthen the protected areas of the Galician coastal zone, including shellfishing areas in the category of Marine Reserve of Fishing Interest. This is the best solution to reduce the vulnerability of the shellfisherwomen collective and increase the mechanisms to protect the shellfishing zones from the pressure of contaminants. It is also a way of ensuring the autonomy the direct participation of shellfisherwomen in the decision-making process, regardless of the internal barriers in the Fishermen's Guild or of external decisions, mainly of the government.

- It would be very positive to promote a disaster prevention and management program in three phases. First, apply environmental education to sensitize coastal communities to the risk of an oil disaster. Then, a local training focused on preparation, response and recovery. And finally, detect critical areas along the coastal zone to create key points provided with tools and equipment to deal with an oil spill. These key points should be co-managed preferably

between the different zones and the government. In addition, this program could indirectly benefit other sources of pollution.

- Finally, to deal with the risk of extinction of the shellfishing, other proposals are made. First, in order to improve sustainable practices, it would be interesting to consolidate working groups with non-governmental environmental organizations (those focused on sustainable fisheries), as well as to reinforce exchanges of good practices among the different groups along the Galician coast. Second, in order to make that category of fisheries more profitable, innovation is essential, using strategies such as direct selling to consumers and certification of shellfish (with environmental, gender equality and fair trade qualification). These actions could bring positive consequences to attract new generations of women to this work, in addition to making the Galician shellfish more competitive against the resources coming from the foreign market. To conclude, this study proposes the creation of a cultural center to value, conserve and transmit culture and knowledge of shellfish through a gender perspective. This equipment, which would be a relevant socio-environmental education tool, could follow the classic model of other fishing museums and / or could have a virtual format.

9. Future research projects

Figure 35: Shellfisherwomen looking for a point of extraction of shellfish at low tide

From the areas covered by this research, and the experience acquired through this study, it is possible to propose some issues that need to be addressed in future research projects with the aim of increasing knowledge about shellfisherwomen, the coastal zone and environmental degradation:

- Evaluate the shellfishing zones with the highest risk, pointing up the main polluters. It would be relevant to deepen into this issue to make it possible to develop a strategic plan for the conservation of estuaries, giving priority to those zones that are most vulnerable. To obtain successful results, it would be interesting to carry out a participatory diagnosis, adding the knowledge and perception of the shellfisherwomen, and not just a technical opinion. From this analysis it would be possible to decide for the best conservation instrument.

- Verify the influence of other dynamics that are endangering shellfishing, such as climate change. Floods in estuarine areas, cyclogenesis and groundswell were codes that emerged in most interviews, which deserve more attention in order to understand their effects on shellfishing zones. The consequence of climate change to women's groups is a field where there are still many gaps, specifically with regard to women in fishery.

- To examine the evolution of the legal framework for the protection of the coastal zone, especially in relation to sources of contaminants at three levels: regional, national and international. This analysis would show where improvements have been made and where improvements could be made. Also, in order to understand the current status of maritime pollution judgments, it would be relevant to review civil and criminal jurisprudence, both nationally and internationally.

- Analyze participatory pollution control experiences on the world stage. Subsequently, following the local characteristics, propose guidelines to implement tools that allow fishermen to control contaminant sources, avoiding future disasters.

10. References

Figure 36: Selected and weighed clams

Abad, Esther, Jose M. Bellido, and Antonio Punzón. 2010. "Transfer of Fishing Effort between Areas and Fishery Units in Spanish Fisheries as Side Effects of the Prestige Oil Spill Management Measures." *Ocean & Coastal Management* 53 (3): 107–113. doi:10.1016/j.ocecoaman.2009.12.002.

Adusah-Karikari, Augustina. 2015. "Black Gold in Ghana: Changing Livelihoods for Women in Communities Affected by Oil Production." *Extractive Industries and Society* 2 (1): 24–32. doi:10.1016/j.exis.2014.10.006.

Agarwal, Bina. 1992. "The Gender and Environment Debate: Lessons from India." *Feminist Studies* 18 (1): 119–158.

Agarwal, Bina. 1997. "Gender , Environment , and Poverty Interlinks : Regional Variations and Temporal Shifts in Rural." *World Development* 25 (1): 23–52.

Agarwal, Bina. 2010. *Gender and Green Governance*. 1st ed. Oxford University Press.

Agüera-Cabo, Mercè. 2008. "L'activisme Femení En Conflictes Ambientals. Reflexions En Clau Feminista I Apunts per a La Gestió Del Medi." *Documents D'anàlisi Geogràfica* 51: 13–37. http://ddd.uab.cat/record/29489.

Agüera-Cabo, Mercè. 2010. "Environmental Governance from a Gender Perspective: Theoretical Reflections and Case Studies." PhD diss., University of Girona.

Agüera-Cabo, Mercè, and Josepa Bru Bistuer. 2012. "Recursos Escassos I Mobilitzacions Mediambientals Des D'una Perspectiva de Gènere." In *Sostenibilitats. Polítiques Públiques de Del Feminisme I L'ecologisme*, edited by Maria Freixanet, 227–279. Barcelona: ICPS.

Aguilar-Revelo, Lorena, Gustavo Briceño, Edgar Chacón and Ilsie Valenciano. 1999. *Qui Cherche Trouve: Élaboration de Diagnostics Participatifs Selon Une Démarche Soucieuse D'équité Entre Les Sexes*. 1st ed. UICN. https://portals.iucn.org/library/node/8188.

Ajibade, Idowu, Gordon McBean, and Rachel Bezner-Kerr. 2013. "Urban Flooding in Lagos, Nigeria: Patterns of Vulnerability and Resilience among Women." *Global Environmental Change* 23 (6): 1714–1725. doi:10.1016/j.gloenvcha.2013.08.009.

Alexander, David. 2009. *Principles of Emergency Planning and Management*. Fifth. Harpenden: Terra Publishing.

Allut, Antonio García. 2003. "La Pesca Artesanal Gallega Y El Problema de La Comercialización: ¿Lonxanet.com Una Alternativa?" *Zainak, Cuadernos de*

Antropología 25: 17–32. http://ruc.udc.es/dspace/bitstream/2183/93/1/Pesca%2520artesanal%2520y%2520comercializacion%2520(Cuad.%2520Antrop.%25202003).pdf.

Alston, Margaret. 2009. "Drought Policy in Australia: Gender Mainstreaming or Gender Blindness?" *Gender, Place & Culture* 16 (2): 139–154. doi:10.1080/09663690902795738.

Álvarez, Rocío Domínguez, and María L. Loureiro. 2013. "Environmental Accidents and Stigmatized Fish Prices : Evidence from the Prestige Oil Spill in Galicia." *Economía Agraria Y Recursos Naturales* 13 (2): 103–126. doi:10.7201/earn.2013.02.05.a.

Anugwom, Edlyne Ezenongaya, and Kenechukwu N. Anugwom. 2009. "The Other Side of Civil Society Story: Women, Oil and the Niger Delta Environmental Struggle in Nigeria." *GeoJournal* 74: 333–346. doi:10.1007/s10708-008-9239-4.

Arata, Catalina M., J. Steven Picou, G. David Johnson, and T. Scott McNally. 2000. "Coping with Technological Disaster: An Application of the Conservation of Resources Model to the Exxon Valdez Oil Spill." *Journal of Traumatic Stress* 13 (1): 23–39. doi:10.1023/A:1007764729337.

Asgary, Ali, and Md Abdul Halim. 2011. "Measuring People's Preferences for Cyclone Vulnerability Reduction Measures in Bangladesh." *Disaster Prevention and Management* 20 (2): 186–198. doi:10.1108/09653561111126111.

Awumbila, Mariama, and Janet Henshall Momsen. 1995. "Gender and the Environment. Women's Time Use as a Measure of Environmental Change." *Global Environmental Change* 5 (4): 337–346.

Balasubramaniam, Anopama, Alexander Rohan Boyle, and Nikolaos Voulvoulis. 2007. "Improving Petroleum Contaminated Land Remediation Decision-Making through the MCA Weighting Process." *Chemosphere* 66 (5): 791–798. doi:10.1016/j.chemosphere.2006.06.039.

Becker, Susan M. 2009. "Psychosocial Care for Women Survivors of the Tsunami Disaster in India." *American Journal of Public Health* 99 (4): 654–658. doi:10.2105/AJPH.2008.146571.

Bennett, Elizabeth. 2005. "Gender, Fisheries and Development." *Marine Policy* 29: 451–459. doi:10.1016/j.marpol.2004.07.003.

Bernabeu, A. M., S. Fernández-Fernández, F. Bouchette, D. Rey, A. Arcos, J. M. Bayona, and J. Albaiges. 2013. "Recurrent Arrival of Oil to Galician Coast: The Final Step of

the Prestige Deep Oil Spill." *Journal of Hazardous Materials* 250–251: 82–90. doi:10.1016/j.jhazmat.2013.01.057.

Bernabeu, Ana M., Daniel Rey, Belén Rubio, Federico Vilas, Carmen Dominguez, Josep M. Bayona, and Joan Albaigés. 2009. "Assessment of Cleanup Needs of Oiled Sandy Beaches: Lessons from the Prestige Oil Spill." *Environmental Science and Technology* 43: 2470–2475. doi:10.1021/es803209h.

Beuving, Joost. 2015. "Spatial Diversity in Small-Scale Fishing: A Socio-Cultural Interpretation of the Nile Perch Sector on Lake Victoria, Uganda." *Tijdschrift Voor Economische En Sociale Geografie* 106 (1): 1–16. doi:10.1111/tesg.12081.

Blaikie, Piers, Terry Cannon, Ian Davis, and Ben Wisner. 1994. *At Risk: Natural Hazards, People's Vulnerability, and Disasters*. First. London: Routledge.

Boada, Martí, Gumersindo Feijoo, and Joan Rieradevall. 2005. *Indicadors Locals de L'impacte Ambiental Del Prestige: Iliam-Petrol*. Barcelona.

Boohene, Rosemond, and James Atta Peprah. 2011. "Women, Livelihood and Oil and Gas Discovery in Ghana: An Exploratory Study of Cape Three Points and Surrounding Communities." *Journal of Sustainable Development* 4 (3): 185–196. doi:10.5539/jsd.v4n3p185.

Born, Abraham F, Eduardo Espinoza, Juan Carlos Murillo, Francis Nicolaides, and Graham J Edgar. 2003. "Effects of the Jessica Oil Spill on Artisanal Fisheries in the Galápagos." *Marine Pollution Bulletin* 47 (7–8): 319–324. doi:10.1016/S0025-326X(03)00161-9.

Britton, Easkey. 2012. "Women as Agents of Wellbeing in Northern Ireland's Fishing Households." *Maritime Studies* 11 (1): 16. doi:10.1186/2212-9790-11-16.

Bru-Bistuer, Josepa. 1995. "El medi està androcentrat. Qui el desandrocentritzarà? Experiència femenina, coneixement ecologic, i canvi cultural". Documents d'anàlisi geogràfica 26: 43-52.

Bru-Bistuer, Josepa. 1996. "Spanish Women against Industrial Waste." In *Feminist Political Ecology*, edited by Dianne Rocheleau, Barbara Thomas-Slayter, and Esther Wangari, 105–124. Londres: Routledge.

Bru-Bistuer, Josepa. 1997. *Medio Ambiente: Poder Y Espetáculo: Gestión Ambiental Y Vida Cotidiana*. Barcelona: Icaria.

Carpenter, Ann. 2015. “Resilience in the Social and Physical Realms: Lessons from the Gulf Coast.” *International Journal of Disaster Risk Reduction* 14: 290–301. doi:10.1016/j.ijdrr.2014.09.003.

Carvalho, Sara C., Fátima Alves, Ulisses M Azeiteiro, and Pablo A. Meira-Cartea. 2012. “Sociocultural and Educational Factors in the Sustainability of Coastal Zones: The Prestige Oil Spill in Galicia, Ten Years Later.” *Management of Environmental Quality: An International Journal* 23 (4): 362–382. doi:10.1108/14777831211232254.

Catalán-Vázquez, Minerva, Horacio Riojas-Rodríguez, and Blanca Estela Pelcastre-Villafuerte. 2012. “Risk Perception and Social Participation among Women Exposed to Manganese in the Mining District of the State of Hidalgo, Mexico.” *Science of the Total Environment* 414: 43–52. doi:10.1016/j.scitotenv.2011.09.079.

Cedre (Centre of Documentation Research and Experimental on Accidental Water) 2015. “Database of Spill Incidents and Threats in Waters around the World.” http://wwz.cedre.fr/en/Our-resources/Spills.

Chen, Jihong, Kevin X. Li, Xiang Liu, and Haobo Li. 2017. “The Development of Ship Registration Policy in China: Response to Flags of Convenience.” *Marine Policy* 83 (May): 22–28. doi:10.1016/j.marpol.2017.05.020.

Cheong, So-Min. 2011. “A Social Assessment of the Hebei-Spirit Oil Spill.” *GeoJournal* 76 (5): 539–549. doi:10.1007/s10708-010-9368-4.

Childs, Merilyn. 2006. “Not through Women’s Eyes: Photo-Essays and the Construction of a Gendered Tsunami Disaster.” *Disaster Prevention and Management* 15 (1): 202–212. doi:10.1108/09653560610654347.

Cissé, A. A., L. Doyen, F. Blanchard, C. Béné, and J. C. Péreau. 2015. “Ecoviability for Small-Scale Fisheries in the Context of Food Security Constraints.” *Ecological Economics* 119. Elsevier B.V.: 39–52. doi:10.1016/j.ecolecon.2015.02.005.

Cohen, Mark A. 1986. “The Costs and Benefits of Oil Spill Prevention and Enforcement.” *Journal of Environmental Economics and Management* 13: 167–188.

Coronel Arias, Paulina, Nancy Janett, García Vázquez, Elisa G Gaxiola Baqueiro, Ana Lucia, Mendoza Ibarra, and Patiño Macías. 2008. “Corresponsabilidad Estado-Sociedad Civil Internacional . Greenpeace España Y El Caso Prestige.” *CONfines* 4/7: 105–118.

CEC (Council of the European Commission) 1999. *Galicia En La Unión Europea*. ec.europa.eu/spain/pdf/galicia_es.pdf.

Cranford, C. J. 2007. "'It's Time to Leave Machismo Behind!': Challenging Gender Inequality in an Immigrant Union." *Gender & Society* 21 (3): 409–438. doi:10.1177/0891243207301501.

Crossland, Christopher J., Dan Baird, Jean-Paul Ducrotoy, Han Lindeboom, Robert W. Buddemeier, William C. Dennison, Bruce A. Maxwell, Stephen V. Smith, and Dennis P. Swaney. 2005. "The Coastal Zone — a Domain of Global Interactions." In *Coastal Fluxes in the Anthropocene*, edited by Christopher J. Crossland, Hartwig H. Kremer, Han J. Lindeboom, Janet I. Marshall Crossland, and Martin D. A. Le Tissier, 1–37. Springer Netherlands. doi:10.1007/3-540-27851-6_1.

Cupples, Julie. 2007. "Gender and Hurricane Mitch: Reconstructing Subjectivities after Disaster." *Disasters* 31 (2): 155–175. doi:10.1111/j.1467-7717.2007.01002.x.

Cutter, Susan L., Kevin D. Ash, and Christopher T. Emrich. 2014. "The Geographies of Community Disaster Resilience." *Global Environmental Change* 29: 65–77. doi:10.1016/j.gloenvcha.2014.08.005.

Cutter, Susan L., Lindsey Barnes, Melissa Berry, Christopher Burton, Elijah Evans, Eric Tate, and Jennifer Webb. 2008. "A Place-Based Model for Understanding Community Resilience to Natural Disasters." *Global Environmental Change* 18 (4): 598–606. doi:10.1016/j.gloenvcha.2008.07.013.

Cutter, Susan L., John Tiefenbacher, and William D. Solecki. 1994. "En-Gendered Fears: Feminity and Technological Risk Perception." In *Environmental Risks and Hazards*, edited by Susan L. Cutter, 137–149. Prentice-Hall.

Davis, Dona, and Siri Gerrard. 2000. "Introduction: Gender and Resource Crisis in the North Atlantic Fisheries." *Women's Studies International Forum* 23 (3): 279–286.

De Silva, Kushani, and Ramanie Jayathilaka. 2014. "Gender in the Context of Disaster Risk Reduction; A Case Study of a Flood Risk Reduction Project in the Gampaha District in Sri Lanka." *Procedia Economics and Finance* 18: 873–881. doi:10.1016/S2212-5671(14)01013-2.

Deb, Apurba Krishna, C. Emdad Haque, and Shirley Thompson. 2015. "'Man Can't Give Birth, Woman Can't Fish': Gender Dynamics in the Small-Scale Fisheries of Bangladesh." *Gender, Place & Culture* 22 (3): 305–324. doi:10.1080/0966369X.2013.855626.

de Moraes, Maria Lygia Quartim. 2003. “Cidadania No Feminino.” In *História Da Cidadania*, edited by Jaime Pinsky and Carla Bessanezi Pinsky, 495–516. Sao Paulo: Editora Contexto.

De Soir, E, a Versporten, E Zech, H Van Oyen, J Mylle, R Kleber, and O van der Hart. 2015. “Does Exposure Type Impact Differentially over Time on the Development of Mental Health Disturbances after a Technological Disaster?” *Arch Public Health* 73 (1): 20. doi:10.1186/s13690-015-0066-z.

Del Olmo García, Pedro, and Jesús Pintos Ager. 2003. “Responsabilidad Civil Por Vertido de Hidrocarburos.” *InDret* 1.

Denzin, Norman K., and Yvonna S. Lincoln. 2003. *Collecting and Interpreting Qualitative Materials*. 2nd ed. Thousand Oaks, CA: Sage Publications.

Dhungel, Rajesh, and Ram Nath Ojha. 2012. “Women’s Empowerment for Disaster Risk Reduction and Emergency Response in Nepal.” *Gender & Development* 20 (2): 309–321. doi:10.1080/13552074.2012.687220.

Di Ciommo, Regina C., and Alexandre Schiavetti. 2012. “Women Participation in the Management of a Marine Protected Area in Brazil.” *Ocean & Coastal Management* 62: 15–23. doi:10.1016/j.ocecoaman.2012.02.010.

Dias, Thelma Lúcia Pereira, Ricardo de Souza Rosa, and Luis Carlos Pereira Damasceno. 2007. “Aspectos Socioeconômicos, Percepção Ambiental E Perspectivas Das Mulheres Marisqueiras Da Reserva de Desenvolvimento Sustentável Ponta Do Tubarão (Rio Grande Do Norte, Brasil).” *Gaia Scientia* 1 (1): 25–35.

Diz-Otero, Isabel, and Marta Lois-González. 2005. “La Reconstrucción de La Sociedad Civil En Galicia: La Catástrofe Del « Prestige » Y El Movimiento Nunca Máis.” *Revista de Estudios Políticos* 129: 255–280.

Dongdong, Lan, Liang Bin, Bao Chenguang, Ma Minghui, Xu Yan, and Yu Chunyan. 2015. “Marine Oil Spill Risk Mapping for Accidental Pollution and Its Application in a Coastal City.” *Marine Pollution Bulletin* 96 (1–2): 220–225. doi:10.1016/j.marpolbul.2015.05.023.

Edgerton-Tarpley, Kathryn. 2004. “Family and Gender in Famine: Cultural Responses to Disaster in North China, 1876-1879.” *Journal of Women’s History* 16 (4): 119–147. doi:10.1353/jowh.2004.0079.

Eisler, Anna D, Hannes Eisler, and Mitsuo Yoshida. 2003. “Perception of Human Ecology: Cross-Cultural and Gender Comparisons.” *Journal of Environmental Psychology* 23 (1): 89–101. doi:10.1016/S0272-4944(02)00083-X.

Eklund, Lisa, and Siri Tellier. 2012. "Gender and International Crisis Response: Do We Have the Data, and Does It Matter?" *Disasters* 36 (4): 589–608. doi:10.1111/j.1467-7717.2012.01276.x.

Enarson, Elaine. 2000. "Gender Issues in Natural Disasters: Talking Points and Research Needs." In *ILO InFocus Programme on Crisis Response and Reconstruction Workshop*. Geneva. http://online.northumbria.ac.uk/geography_research/gdn/resources/ilo-talking.doc.

Enarson, Elaine. 1998. "Through Women's Eyes: A Gendered Research Agenda for Disaster Social Science." *Disasters* 22 (2): 157–173. doi:10.1111/1467-7717.00083.

Ercilla, Gemma, Diego Córdoba, Josep Gallart, Eulalia Gràcia, Josep A. Muñoz, Luis Somoza, Juan T. Vázquez, Federico Vilas, and Prestige Group. 2006. "Geological Characterization of the Prestige Sinking Area." *Marine Pollution Bulletin* 53: 208–219. doi:10.1016/j.marpolbul.2006.03.016.

Eriksen, Christine, Nicholas Gill, and Lesley Head. 2010. "The Gendered Dimensions of Bushfire in Changing Rural Landscapes in Australia." *Journal of Rural Studies* 26 (4): 332–342. doi:10.1016/j.jrurstud.2010.06.001.

Erlandson, Jon M, and Torben C Rick. 2010. "Archaeology Meets Marine Ecology: The Antiquity of Maritime Cultures and Human Impacts on Marine Fisheries and Ecosystems." *Annual Review of Marine Science* 2 (January): 231–251. doi:10.1146/annurev.marine.010908.163749.

EOI (Escuela de Organización Industrial) 2005. *El Sector Pesquero Y La Industria Conservera : Repercusión En El Empleo*. https://www.eoi.es/es/file/17316/download?token=C5CCeU3D.

España. 1993. "Lley 6/1993, de 11 de Mayo, de Pesca de Galicia." *Boletín Oficial Del Estado*. Madrid. https://www.boe.es/diario_boe/txt.php?id=BOE-A-1993-17032

España. 2013. "Lley 19/2013, de 9 de Diciembre, de Transparencia, Acceso a La Información Pública Y Buen Gobierno." *Boletín Oficial Del Estado*. Madrid. doi:10.1016/S0041-8633(14)70052-3.

Europe. 2004. "Regulation No 854/2004 of the European Parliament and of the Council of 29 April 2004." Official Journal of the European Union. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:226:0083:0127:EN:PDF.

EC (European Commission) 1998. *A Guide to Gender Impact Assessment - Equality Between Women and Men*. http://bookshop.europa.eu/en/a-guide-to-gender-impact-assessment-pbCE1698788/.

EEA (European Environment Agency) 2016. *European Bathing Water Quality in 2015.* Copenhagen. http://www.eea.europa.eu/publications/european-bathing-water-quality-in-2014.

EIGE (European Institute for Gender Equality) 2016. *Gender Impact Assessment: Gender Mainstreaming Toolkit*. Vilnius. doi:10.2839/371111.

Evans, Stewart M, Susan Gebbels, and Joanna M Stockill. 2008. "'Our Shared Responsibility': Participation in Ecological Projects as a Means of Empowering Communities to Contribute to Coastal Management Processes." *Marine Pollution Bulletin* 57 (1–5): 3–7. doi:10.1016/j.marpolbul.2008.04.014.

Fadigas, Amanda Braga de Melo, and Loreley Gomes Garcia. 2012. "Conservation of the Estuarine Zone of the Goiana and Megaó Rivers in Northeastern Brazil: An Analysis of the Strategies Adopted by Fisherwomen Communities." *Revista de Gestão Costeira Integrada* 12 (4): 577–582. doi:10.5894/rgci386.

Fakhruddin, S. H M, and Juma Rahman. 2014. "Coping with Coastal Risk and Vulnerabilities in Bangladesh." *International Journal of Disaster Risk Reduction* 12: 112–118. doi:10.1016/j.ijdrr.2014.12.008.

Fatusin, A F, Aribigbola Afolabi, and G A Adetula. 2010. "The Impacts of Oil and Gas Pollution on Female Gender in Ilaje , Niger Delta Region of Ondo State Nigeria." *Journal of Human Ecology* 32 (3): 189–196.

Fordham, M H. 1998. "Making Women Visible in Disasters: Problematizing the Private Domain." *Disasters* 22 (2): 126–143. http://www.ncbi.nlm.nih.gov/pubmed/9654812.

Fothergill, Alice. 1999. "Women's Roles in a Disaster." *Applied Behavioral Science Review* 7 (2): 125–143. doi:10.1016/S1068-8595(00)80014-8.

Frangoudes, Katia, Begoña Marugán-Pintos, and José J. Pascual-Fernández. 2008. "From Open Access to Co-Governance and Conservation: The Case of Women Shellfish Collectors in Galicia (Spain)." *Marine Policy* 32 (2): 223–232. doi:10.1016/j.marpol.2007.09.007.

Franz-Balsen, Angela. 2014. "Gender and (Un)Sustainability - Can Communication Solve a Conflict of Norms?" *Sustainability* 6: 1973–1991. doi:10.3390/su6041973.

Fuentes-Castro, D. 2005. "Efectos Distributivos de Las Compensaciones Por Inactividad Concedidas Al Sector Pesquero Afectado Por La Marea Negra Del Prestige." *Economía Agraria Y Recursos Naturales* 5 (9): 165–190.

Gaillard, J. C., and J. Mercer. 2012. "From Knowledge to Action: Bridging Gaps in Disaster Risk Reduction." *Progress in Human Geography* 37 (1): 93–114. doi:10.1177/0309132512446717.

Galícia. 2005. "Decreto 28/2005." Santiago de Compostela: Diario Oficial de Galicia. http://www.xunta.gal/dog/Publicados/2005/20050224/Anuncio599A_es.html.

Ganapati, N. Emel. 2012. "In Good Company: Why Social Capital Matters for Women during Disaster Recovery." *Public Administration Review* 72 (3): 419–427. doi:10.1111/j.1540-6210.2011.02526.x.

García-Mira, R., J.E. Real, D.L. Uzzell, C. San Juan, and E. Pol. 2006. "Coping with a Threat to Quality of Life: The Case of the Prestige Disaster." *Revue Européenne de Psychologie Appliquée/European Review of Applied Psychology* 56: 53–60. doi:10.1016/j.erap.2005.02.008.

García-Negro, M.C., C.S. Villasante, and A. Carballo-Penela. 2007. "Compensating System for Damages Caused by Oil Spill Pollution: Background for the Prestige Assessment Damage in Galicia, Spain." *Ocean & Coastal Management* 50 (1–2): 57–66. doi:10.1016/j.ocecoaman.2006.08.014.

García-Negro, M.C., S. Villasante, A. Carballo-Penela, and G. Rodríguez-Rodríguez. 2009. "Estimating the Economic Impact of the Prestige Oil Spill on the Death Coast (NW Spain) Fisheries." *Marine Policy* 33: 8–23. doi:10.1016/j.marpol.2008.03.011.

Garcia-Negro, María do Carme, and Yolanda N. Zotes-Tarrio. 2006. "El Trabajo de Las Mujeres En El Sector Pesquero Gallego: Analisis de Los Problemas Relacionados Con Su Tratamiento Estadistico." *Revista Gallega de Economía* 15 (1): 1–25.

García-Pérez, J D. 2003. "Early Socio-Political and Environmental Consequences of the Prestige Oil Spill in Galicia." *Disasters* 27 (3): 207–223. http://www.ncbi.nlm.nih.gov/pubmed/14524046.

Garza-Gil, M. Dolores, Albino Prada-Blanco, and M. Xosé Vázquez-Rodríguez. 2006. "Estimating the Short-Term Economic Damages from the Prestige Oil Spill in the Galician Fisheries and Tourism." *Ecological Economics* 58: 842–849. doi:10.1016/j.ecolecon.2005.09.009.

Garza-Gil, M. Dolores, Juan C. Surís-Regueiro, and Manuel M. Varela-Lafuente. 2006. "Assessment of Economic Damages from the Prestige Oil Spill." *Marine Policy* 30: 544–551. doi:10.1016/j.marpol.2005.07.003.

Gill, Duane A., J. Steven Picou, and Liesel A. Ritchie. 2012. "The Exxon Valdez and BP Oil Spills: A Comparison of Initial Social and Psychological Impacts." *American Behavioral Scientist* 56 (1): 3–23. doi:10.1177/0002764211408585.

Ginige, Kanchana, Dilanthi Amaratunga, and Richard Haigh. 2009. "Mainstreaming Gender in Disaster Reduction: Why and How?" *Disaster Prevention and Management* 18 (1): 23–34. doi:10.1108/09653560910938510.

Gochfeld, M, and B D Goldstein. 1999. "Lessons in Environmental Health in the Twentieth Century." *Annual Review of Public Health* 20 (January): 35–53. doi:10.1146/annurev.publhealth.20.1.35.

Göncüoğlu, H., and V. Ünal. 2011. "Fisherwomen in the Turkish Fishery, Southern Aegean Sea." *Journal of Applied Ichthyology* 27: 1013–1018. doi:10.1111/j.1439-0426.2011.01721.x.

Gordon, Liz. 2013. "Preserving Family and Community: Women's Voices from the Christchurch Earthquakes." *Disaster Prevention and Management* 22 (5): 415–424. doi:http://dx.doi.org/10.1108/09564230910978511.

Grattan, Lynn M., Sparkle Roberts, William T. Mahan Jr., Patrick K. McLaughlin, W. Steven Otwell, and J. Glenn Morris Jr. 2011. "The Early Psychological Impacts of the Deepwater Horizon Oil Spill on Florida and Alabama Communities." *Environmental Health Perspectives* 119 (6): 838–843. doi:10.1289/ehp.1002915.

Haddow, George D., Jane A. Bullock, and Damon P. Coppola. 2007. *Introduction to Emergency Management*. 3rd ed. Burlington: Butterworth-Heinemann.

Hamilton, Jennifer Parker, and Sarah J. Halvorson. 2007. "The 2005 Kashmir Earthquake." *Mountain Research and Development* 27 (4): 296–301. doi:10.1659/mrd.0945.

Hapke, Holly M. 2001. "Gender, Work , and Household Survival in South Indian Fishing Communities : A Preliminary Analysis." *The Professional Geographer* 53 (3): 313–331.

Hardin, Garrett. 1968. "The Tragedy of the Commons." *Science* 162 (3859): 1243–1248. doi:10.1126/science.162.3859.1243.

Harper, Sarah, Dirk Zeller, Melissa Hauzer, Daniel Pauly, and Rashid Ussif Sumaila. 2013. "Women and FIsheries Contribution to Food Security and Local Economie." *Marine Policy* 39: 56–63. doi:https://doi.org/10.1016/j.marpol.2012.10.018.

Hauzer, Melissa, Philip Dearden, and Grant Murray. 2013a. "The Effectiveness of Community-Based Governance of Small-Scale Fisheries, Ngazidja Island, Comoros." *Marine Policy* 38: 346–354. doi:10.1016/j.marpol.2012.06.012.

Hauzer, Melissa, Philip Dearden, and Grant Murray. 2013b. "The Fisherwomen of Ngazidja Island, Comoros: Fisheries Livelihoods, Impacts, and Implications for Management." *Fisheries Research* 140: 28–35. doi:10.1016/j.fishres.2012.12.001.

Hiwasaki, Lisa, Emmanuel Luna, Syamsidik, and Rajib Shaw. 2014. "Process for Integrating Local and Indigenous Knowledge with Science for Hydro-Meteorological Disaster Risk Reduction and Climate Change Adaptation in Coastal and Small Island Communities." *International Journal of Disaster Risk Reduction* 10: 15–27. doi:10.1016/j.ijdrr.2014.07.007.

Hong, Seongjin, Jong Seong Khim, Jongseong Ryu, Seong Gil Kang, Won Joon Shim, and Un Hyuk Yim. 2014. "Environmental and Ecological Effects and Recoveries after Five Years Ofthe Hebei Spirit Oil Spill, Taean, Korea." *Ocean and Coastal Management* 102 (PB). Elsevier Ltd: 522–532. doi:10.1016/j.ocecoaman.2014.01.006.

Ikelegbe, Augustine. 2005. "Engendering Civil Society: Oil, Women Groups and Resource Conflicts in the Niger Delta Region of Nigeria." *The Journal of Modern African Studies* 43 (2): 241–270. doi:10.1017/S0022278X05000820.

Immanuel, S., and G. Syda Rao. 2009. "The Status of Fisherwomen in Andhra Pradesh." *Indian Journal of Gender Studies* 16 (3): 411–423. doi:10.1177/097152150901600306.

Imperiale, Angelo Jonas, and Frank Vanclay. 2016. "Experiencing Local Community Resilience in Action: Learning from Post-Disaster Communities." *Journal of Rural Studies* 47: 204–219. doi:10.1016/j.jrurstud.2016.08.002.

IGE (Galician Statistical Institute) 2001. "Permisos de Marisqueo a Pé Por Sexo E Confrarías Ou Agrupación de Mariscadores." http://www.ige.eu/igebdt/selector.jsp?COD=5356&paxina=001&c=0301004.

IGE (Galician Statistical Institute) 2015. *Análise Do Sector Da Pesca*. *Xunta de Galicia*. https://www.ige.eu/estatico/pdfs/s3/publicaciones/AnaliseSectorPesca.pdf.

IGE (Galician Statistical Institute) 2016. “Permisos de Marisqueo a Pé Por Sexo E Confrarías Ou Agrupación de Mariscadores.” https://www.ige.eu/igebdt/esqv.jsp?ruta=verTabla.jsp?OP=1&B=1&M=&COD=3739&R=2[0];0[2016]&C=1[all]&F=&S=998:12&SCF=.

IA (International Alert) 2014. *What’s in It for Us? Gender Issues in Uganda’s Oil and Gas Sector*. London. http://www.international-alert.org/sites/default/files/Uganda_GenderOilGas_EN_2014.pdf.

Işık, Özden, Naşide Özer, Nurdan Sayın, Afet Mishal, Oğuz Gündoğdu, and Ferhat Özçep. 2015. “Are Women in Turkey Both Risks and Resources in Disaster Management?” *International Journal of Environmental Research and Public Health* 12 (6): 5758–5774. doi:10.3390/ijerph120605758.

Izagirre, U, L Garmendia, M Soto, N Etxebarria, and I Marigómez. 2014. “Health Status Assessment through an Integrative Biomarker Approach in Mussels of Different Ages with a Different History of Exposure to the Prestige Oil Spill.” *Science of the Total Environment* 493: 65–78. doi:10.1016/j.scitotenv.2014.05.118.

Jackson, Cecile. 1998. “Gender, Irrigation, and Environment: Arguing for Agency.” *Agriculture and Human Values* 15: 313–324.

Jahan, Momtaz. 2008. “The Impact of Environmental Degradation on Women in Bangladesh: An Overview.” *Asian Affairs* 30 (2): 5–15.

James, J, and J Lin. 2015. “Women’s Considerations in Disaster Risk Reduction Trainings.” *Annals of Global Health* 81 (1): 33. doi:10.1016/j.aogh.2015.02.586.

Junoy, Juan, Carolina Castellanos, José Manuel Viéitezitez, and Rodrigo Riera. 2013. “Seven Years of Macroinfauna Monitoring at Ladeira Beach (Corrubedo Bay, NW Spain) after the Prestige Oil Spill.” *Oceanologia* 55 (2): 393–407. doi:10.5697/oc.55-2.393.

Karl, Terry Lynn. 2004. “Oil-Led Development : Social, Political, and Economic Consequences.” *Encyclopedia of Energy* 4: 661–672.

Kevany, Kathleen, and Donald Huisingh. 2013. “A Review of Progress in Empowerment of Women in Rural Water Management Decision-Making Processes.” *Journal of Cleaner Production* 60: 53–64. doi:10.1016/j.jclepro.2013.03.041.

Khalafzai, Arshad Khan, and Niru Nirupama. 2011. “Building Resilient Communities through Empowering Women with Information and Communication

Technologies: A Pakistan Case Study." *Sustainability* 3 (1): 82–96. doi:10.3390/su3010082.

Kim, Dohyeong, Gi-geun Yang, Soojin Min, and Chul-hwan Koh. 2014. "Social and Ecological Impacts of the Hebei Spirit Oil Spill on the West Coast of Korea: Implications for Compensation and Recovery." *Ocean & Coastal Management* 102: 533–544. doi:10.1016/j.ocecoaman.2014.05.023.

Kimura, Aya Hirata, and Yohei Katano. 2014. "Farming after the Fukushima Accident: A Feminist Political Ecology Analysis of Organic Agriculture." *Journal of Rural Studies* 34: 108–116. doi:10.1016/j.jrurstud.2013.12.006.

Kwok, Alan H, Emma E H Doyle, Julia Becker, David Johnston, and Douglas Paton. 2016. "What Is 'social Resilience'? Perspectives of Disaster Researchers, Emergency Management Practitioners, and Policymakers in New Zealand." *International Journal of Disaster Risk Reduction* 19: 197–211. doi:http://dx.doi.org/10.1016/j.ijdrr.2016.08.013.

La Voz de Galicia. "Especial Prestige: La Tragedia Del 13-N." https://prestige.lavozdegalicia.es.

La Voz de Galicia. 2003. "Fuel Del Prestige Llega a Francia Medio Año Después Del Accidente." *La Voz*. http://www.lavozdegalicia.es/hemeroteca/2003/05/05/1655123.shtml.

Lafuente-Varela, Manuel, and Carlos Malvido-Iglesias. 2000. "Tendencias Y Problemas de La Pesca Gallega En El Contexto Mundial Y Comunitario." *Revista Galega de Economía* 9 (1): 1–27. http://www.usc.es/econo/RGE/Vol.9_1/Castel%E1n/Tendencias y problemas de la pesca gallega.pdf.

Larruga, Francisco Javier Sanz, Marta García Pérez, and Juan José Pernas García. 2005. "Las Lecciones Jurídicas Del Caso Prestige: Diez Tesis Sobre La Mejora de La Seguridad Del Transporte Marítimo Y La Protección Del Medio Ambiente En España." *Revista Electónica de Derecho Ambiental* 12–13. http://huespedes.cica.es/gimadus/12-13/LECCIONES_PRESTIGE.htm.

Larson, K. L., D. C. Ibes, and D. D. White. 2010. "Gendered Perspectives About Water Risks and Policy Strategies: A Tripartite Conceptual Approach." *Environment and Behavior* 43 (3): 415–438. doi:10.1177/0013916510365253.

Laxe-González, Fernando. 2003. *El Impacto Del Prestige: Análisis Y Evaluación de Los Daños Causados Por El Accidente Del Prestige Y Dispositivos Para La Regeneración Medioambiental Y Recuperación Económica de Galicia.* A Coruña: Fundación Pedro Barrié de la Maza : Instituto de Estudios Económicos.

Lilley, Matthew, and Robert Slonim. 2016. "Gender Differences in Altruism: Responses to a Natural Disaster." *IZA Discussion Paper Series* 9657.

Lin, Shih-Chang, Yi-Che Shih, and Wen-Yan Chiau. 2013. "An Impact Analysis of Destructive Fishing and Offshore Oil Barges on Marine Living Resources in Taiwan Strait." *Ocean & Coastal Management* 80: 119–131. doi:10.1016/j.ocecoaman.2013.04.011.

Littig, Beate. 2001. *Feminist Perspectives on Environment and Society*. Harlow: Pearson Education.

Loureiro-García, María, and M. Xosé Vázquez-Rodríguez. 2006. "Incentivos Y Políticas de Gestión de Catástrofes Ambientales Marinas : El Prestige." *Cuadernos Económicos de ICE* 71: 199–219.

Loureiro, Maria L., John B. Loomis, and Maria Xosé Vázquez. 2009. "Economic Valuation of Environmental Damages due to the Prestige Oil Spill in Spain." *Environmental and Resource Economics* 44: 537–553. doi:10.1007/s10640-009-9300-x.

Magalhães, André, Rauquírio Marinho da Costa, Rossivaldo da Silva, and Luci Cajueiro Carneiro Pereira. 2007. "The Role of Women in the Mangrove Crab (Ucides Cordatus, Ocypodidae) Production Process in North Brazil (Amazon Region, Pará)." *Ecological Economics* 61 (March): 559–565. doi:10.1016/j.ecolecon.2006.05.013.

Magaña-Frade, Irene, Sebastián Silva-Nadales, and Rayen Rovira-Rubio. 2010. "Catástrofe, Subjetividad Femenina Y Reconstrucción : Aportes Y Desafíos Desde Un Enfoque de Género Para La Intervención Psicosocial En Comunidades Afectadas Por El Terremoto." *Terapia Psicológica* 28 (2): 169–177.

Marigómez, Ionan, Larraitz Garmendia, Manu Soto, Amaia Orbea, Urtzi Izagirre, and Miren P Cajaraville. 2013. "Marine Ecosystem Health Status Assessment through Integrative Biomarker Indices: A Comparative Study after the Prestige Oil spill 'Mussel Watch'." *Ecotoxicology* 22: 486–505. doi:10.1007/s10646-013-1042-4.

Martínez, Ana Sabaté. 2000. "Género, Medio Ambiente Y Acción Política: Un Debate Pendiente En La Geografía Actual." *Anales de Geografía de La Universidad Complutense* 20: 177–191.

Marugán-Pintos, Begoña. 2004. *Y Cogieron Ese Tren. Profesionalización de Las Mariscadoras Gallegas*. 1st ed. Xunta de Galicia.

Marugán-Pintos, Begoña. 2012. "La Organización de Las Mariscadoras Como Agentes de Transformación Social." *Em Debate* 7: 82–106. doi:http://dx.doi.org/10.5007/1980-3532.2012n7p82.

McCusker, Brent, and Ann M. Oberhauser. 2006. "An Assessment of Women's Access to Natural Resources through Communal Projects in South Africa." *GeoJournal* 66 (4): 325–339. doi:10.1007/s10708-006-9006-3.

Méheux, Kirstie, Dale Dominey-Howes, and Kate Lloyd. 2010. "Operational Challenges to Community Participation in Post-Disaster Damage Assessments: Observations from Fiji." *Disasters* 34 (4): 1102–1122. doi:10.1111/j.1467-7717.2010.01185.x.

Merchant, Carolyn. 1996. *Earthcare: Women and the Environment*. New York: Routledge.

Mies, María, and Vandana Shiva. 1998. *La Praxis Del Ecofeminismo*. Barcelona: Icaria.

Magrama (Ministry of Environment, Agriculture, Fisheries and Food) 2016. *Sobre La Situación Profesional de Las Mujeres En El Oficio Del Marisqueo En España*. http://www.mapama.gob.es/es/pesca/temas/red-mujeres/diagnosticomariscadoras28042016_tcm7-419685.pdf.

Morioka, Rika. 2014. "Gender Difference in the Health Risk Perception of Radiation from Fukushima in Japan: The Role of Hegemonic Masculinity." *Social Science and Medicine* 107: 105–112. doi:10.1016/j.socscimed.2014.02.014.

Mulyasari, Farah, and Rajib Shaw. 2013. "Role of Women as Risk Communicators to Enhance Disaster Resilience of Bandung, Indonesia." *Natural Hazards* 69 (3): 2137–2160. doi:10.1007/s11069-013-0798-4.

Munizaga, Claudio Aguirre, Alberto Díaz Araya, and Carlos Mondaca Rojas. 2014. "De Pescador Artesanal a Tripulante Pesquero. Pesca Industrial Y Transformaciones Sociales En Tarapacá. Norte de Chile (1950-1990)." *Intersecciones En Antropologia* 15 (1): 177–185.

Munk-Madsen, Eva. 2000. “Wife the Deckhand, Husband the Skipper: Authority and Dignity among Fishing Couples.” *Women’s Studies International Forum* 23 (3): 333–342.

Nagy Hesse-Biber, Sharlene. 2007. “The Practice of Feminist in-Depth Interviewing.” In *Feminist Research Practice*, edited by Lina Leavy, 111–148. Sage Publications.

Nakhaei, Maryam, Hamid Reza Khankeh, Gholam Reza Masoumi, Mohammad Ali Hosseini, Zohreh Parsa-Yekta, Lisa Kurland, and Maaret Castren. 2015. “Impact of Disaster on Women in Iran and Implication for Emergency Nurses Volunteering to Provide Urgent Humanitarian Aid Relief: A Qualitative Study.” *Australasian Emergency Nursing Journal* 18 (3). College of Emergency Nursing Australasia: 165–172. doi:10.1016/j.aenj.2015.02.002.

NAPE (National Association of Professional Environmentalists) 2016. *Women-Led Action Oriented Research on the Negative Impacts of Oil on Women’s Rights, Land and Food Sovereignty in Uganda’s Oil Region*. Kampala. http://oilwatchafrica.org/static/media/uploads/attachments/women_led__action_-oriented__report.pdf.

Nation, Marcia L. 2010. “Understanding Women’s Participation in Irrigated Agriculture: A Case Study from Senegal.” *Agriculture and Human Values* 27: 163–176. doi:10.1007/s10460-009-9207-8.

Negret, Carlos Felipe Llinás. 2016. “Pretending to Be Liberian and Panamanian: Flags of Convenience and the Weakening of the Nation State on the High Seas.” *Journal of Maritime Law and Commerce* 47 (1–28): 1–29.

Nowak, Barbara S. 2008. “Environmental Degradation and Its Gendered Impact on Coastal Livelihoods Options among Btsisi ’ Households of Peninsular Malaysia.” *Development* 51: 186–192. doi:10.1057/dev.2008.3.

Olivieri, Alejandro, and Luciano Florit. 1996. “A Construção Social Da Questão Ecológica: Um Questionamento Do Final Do Século.” *Revista de Ciências Humanas* 14 (19): 55–65. doi:10.5007/23499.

Otero, P., M. Ruiz-Villarreal, S. Allen-Perkins, B. Vila, and J. M. Cabanas. 2014. “Coastal Exposure to Oil Spill Impacts from the Finisterre Traffic Separation Scheme.” *Marine Pollution Bulletin* 85 (1). Elsevier Ltd: 67–77. doi:10.1016/j.marpolbul.2014.06.020.

Ovetz, Robert. 2007. “The Bottom Line: An Investigation of the Economic, Cultural and Social Costs of High Seas Industrial Longline Fishing in the Pacific and the Benefits of Conservation (DOI:10.1016/j.marpol.2006.04.001).” *Marine Policy* 31 (2): 217–228. doi:10.1016/j.marpol.2006.09.002.

Palinkas, Lawrence A. 2012. "A Conceptual Framework for Understanding the Mental Health Impacts of Oil Spills: Lessons from the Exxon Valdez Oil Spill." *Psychiatry* 75 (3): 203–222. doi:10.1521/psyc.2012.75.3.203.

Patin, Stanislav. 2004. "Crude Oil Spills, Environmental Impact of." *Encyclopedia of Energy* 1: 737–748.

Perez de Oliveira, Lucia. 2013. "Fishers as Advocates of Marine Protected Areas: A Case Study from Galicia (NW Spain)." *Marine Policy* 41 (September). Elsevier: 95–102. doi:10.1016/j.marpol.2012.12.024.

Pérez-Pereira, Miguel, Carolina Tinajero, María Soledad Rodriguez, Manuel Peralbo, and Jose Manuel Sabucedo. 2012. "Academic Effects of the Prestige Oil Spill Disaster." *The Spanish Journal of Psychology* 15 (3): 1055–1068. doi:http://dx.doi.org/10.5209/rev_SJOP.2012.v15.n3.39396.

Pesca de Galicia. 2017. "Cotizacións Nas Lonxas." https://www.pescadegalicia.gal/cotizaciones/ventas.aspx

Paul, Bimal Kanti. 2011. *Environmental Hazards and Disasters. Contexts, Perspectives and Management*. First. Wiley-Blackwell.

Perera-Mubarak, Kamakshi N. 2013. "Positive Responses, Uneven Experiences: Intersections of Gender, Ethnicity, and Location in Post-Tsunami Sri Lanka." *Gender, Place & Culture* 20 (5): 664–685. doi:10.1080/0966369X.2012.709828.

Pincha, Chaman. 2008. *Gender Sensitive Disaster Management*. Mumbai: Earthworm Books.

Puleo, Alicia H. 2011. *Ecofeminismo Para Otro Mundo Posible*. Madrid: Ediciones Cátedra.

Rahikainen, Mika, Inari Helle, Päivi Haapasaari, Soile Oinonen, Sakari Kuikka, Jarno Vanhatalo, Samu Mäntyniemi, and Kirsi-Maaria Hoviniemi. 2014. "Toward Integrative Management Advice of Water Quality, Oil Spills, and Fishery in the Gulf of Finland: A Bayesian Approach." *Ambio* 43 (1). Springer Netherlands: 115–123. doi:10.1007/s13280-013-0482-7.

Raya, Manuel, Santiago Torres, and Lourdes Guiteras. 2002. "Galícia Negra." TV3. http://www.tv3.cat/30minuts/reportatges/294/Galicia-negra.

Reichel, Christian, and Urte Undine Frömming. 2014. "Participatory Mapping of Local Disaster Risk Reduction Knowledge: An Example from Switzerland." *International Journal of Disaster Risk Science* 5: 41–54. doi:10.1007/s13753-014-0013-6.

Renn, Ortwin. 2004. “Perception of Risks.” *Toxicology Letters* 149: 405–413. doi:10.1016/j.toxlet.2003.12.051.

Reyes, Daniella Dominique, and Jinky Leilanie Lu. 2016. “Gender Dimension in Disaster Situations: A Case Study of Flood Prone Women in Malabon City, Metro Manila.” *International Journal of Disaster Risk Reduction* 15: 162–168. doi:10.1016/j.ijdrr.2015.11.001.

Resurrección, Bernadette P. 2013. “Women ’ S Studies International Forum Persistent Women and Environment Linkages in Climate Change and Sustainable Development Agendas.” *Women’s Studies International Forum* 40. Elsevier Ltd: 33–43. doi:10.1016/j.wsif.2013.03.011.

Rocha, Ligia M., and Evelyn Pinkerton. 2015. “Comanagement of Clams in Brazil: A Framework to Advance.” *Ecology and Society* 20 (1). doi:10.5751/ES-07095-200107.

Rocheleau, Dianne, and David Edmunds. 1997. “Women, Men and Trees: Gender, Power and Property in Forest and Agrarian Landscapes.” *World Development* 25 (8): 1351–1371. doi:10.1016/S0305-750X(97)00036-3.

Rolland, Eduardo. 2013. “Curiosidades Del «Polycommander».” *La Voz de Galicia*. http://www.lavozdegalicia.es/noticia/vigo/2013/11/10/curiosidades-polycommander/0003_201311V10C4999.htm.

Rossman, Gretchen. B., and Sharon.F. Rallis. 2003. *Learning in the Field. An Introduction to Qualitative Research*. 2nd ed. Sage Publications.

Rozas, Lawrence P, Thomas J Minello, and Charles B Henry. 2000. “An Assessment of Potential Oil Spill Damage to Salt Marsh Habitats and Fishery Resources in Galveston Bay, Texas.” *Marine Pollution Bulletin* 40 (12): 1148–1160. doi:10.1016/S0025-326X(00)00075-8.

Rubí i Puig, Antoni, and José Piñeiro Salguero. 2003. “El Blindaje Del Gobierno En La Crisis Del Prestige. Comentario Al Real Decreto Ley 4/2003, de 20 de Junio, de Ayudas a Los Damnificados.” *In Dret*.

Ruiz-Villarreal, M., C. González-Pola, G. Diaz del Rio, A. Lavin, P. Otero, S. Piedracoba, and J. M. Cabanas. 2006. “Oceanographic Conditions in North and Northwest Iberia and Their Influence on the Prestige Oil Spill.” *Marine Pollution Bulletin* 53: 220–238. doi:10.1016/j.marpolbul.2006.03.011.

Sabaté-Martínez, Ana, Juana María Rodríguez Moya, and María Ángelez Díaz Muñoz. 1995. *Mujeres, Espacio Y Sociedad. Hacia Una Geografía de Género*. Madrid: Editorial Síntesis.

Sabaté-Martínez, Ana. 2000. "Género, Medio Ambiente Y Acción Política: Un Debate Pendiente En La Geografía Actual." *Anales de Geografía de La Universidad Complutense* 20: 177–191.

Sadia, Haleema, Muhammad Jawed Iqbal, Junaid Ahmad, Arshad Ali, and Anees Ahmad. 2016. "Gender-Sensitive Public Health Risks and Vulnerabilities' Assessment With Reference To Floods in Pakistan." *International Journal of Disaster Risk Reduction* 19: 47–56. doi:10.1016/j.ijdrr.2016.08.024.

Safford, Thomas G., Jessica D. Ulrich, and Lawrence C. Hamilton. 2012. "Public Perceptions of the Response to the Deepwater Horizon Oil Spill: Personal Experiences, Information Sources, and Social Context." *Journal of Environmental Management* 113: 31–39. doi:10.1016/j.jenvman.2012.08.022.

Saito, Yoko. 2014. "Progress or Repetition? Gender Perspectives in Disaster Management in Japan." *Disaster Prevention and Management* 23 (2): 98–111. doi:10.1108/DPM-08-2013-0134.

Saldaña, Johnny. 2009. *The Coding Manual for Qualitative Researchers*. 1st ed. Sage Publications.

Sampedro, Javier. 2005. "El Turno de Las Bacterias." *El País*. http://elpais.com/diario/2005/09/18/sociedad/1126994401_850215.html.

Samuel, Lina. 2007. "Women, Work and Fishing: An Examination of the Lives of Fisherwomen in Kerala." *South Asia Research* 27 (2): 205–227. doi:10.1177/026272800702700205.

San Sebastián, Miguel, Ben Armstrong, and Carolyn Stephens. 2001. "La Salud de Mujeres Que Viven Cerca de Pozos Y Estaciones de Petróleo En La Amazonía Ecuatoriana." *Revista Panamericana de Salud Pública* 9 (6): 375–384.

Scharffscher, Kristin S. 2011. "Disempowerment through Disconnection: Local Women's Disaster Response and International Relief in Post-Tsunami Batticaloa." *Disaster Prevention and Management* 20 (1): 63–81. doi:10.1108/09653561111111090.

Scott, Joan W. 1986. "Gender: A Useful Category of Historical Analysis." *The American Historical Review* 91 (5): 1053–1075. http://www.jstor.org/stable/1864376.

Scott, Dayna Nadine. 2009. "'Gender-Benders': Sex and Law in the Constitution of Polluted Bodies." *Feminist Legal Studies* 17 (3): 241–265. doi:10.1007/s10691-009-9127-4.

Seager, Joni. 2006. "Noticing Gender (or Not) in Disasters." *Geoforum* 37 (1): 2–3. doi:10.1016/j.geoforum.2005.10.004.

Shandra, John M., Carrie L. Shandra, and Bruce London. 2008. "Women, Non-Governmental Organizations, and Deforestation: A Cross-National Study." *Population and Environment* 30 (1–2): 48–72. doi:10.1007/s11111-008-0073-x.

Shepherd, Dean A., and Trenton A. Williams. 2014. "Local Venturing as Compassion Organizing in the Aftermath of a Natural Disaster: The Role of Localness and Community in Reducing Suffering." *Journal of Management Studies* 51 (6): 952–994. doi:10.1111/joms.12084.

Solana-Ortega, Alberto, and Vicente Solana. 2007. "What Comes after the Prestige Disaster? An Entropic Approach to Modeling the Recurrence of Major Oil Tanker Spills in Galicia." *Risk Analysis: An Official Publication of the Society for Risk Analysis* 27 (4): 901–920. doi:10.1111/j.1539-6924.2007.00931.x.

Sotelo, José Antonio Navalpotro. 2003. "Desarrollo Y Medio Ambiente En España: Algunas Consecuencias Directas Emanadas Del Hundimiento Del Prestige." *Anales de Geografía de La Universidad Complutense* 23: 207–254.

Spindler, Helle, Ask Elklit, and Dorte Christiansen. 2010. "Risk Factors for Posttraumatic Stress Disorder Following an Industrial Disaster in a Residential Area: A Note on the Origin of Observed Gender Differences." *Gender Medicine* 7 (2). Excerpta Medica Inc.: 156–165. doi:10.1016/j.genm.2010.04.001.

Stott, Robin. 2010. "Population and Climate Change: Moving toward Gender Equality Is the Key." *Journal of Public Health* 32 (2): 159–160. doi:10.1093/pubmed/fdq040.

Surís-Regueiro, Juan C, M Dolores Garza-Gil, and Manuel M Varela-Lafuente. 2007. "The Prestige Oil Spill and Its Economic Impact on the Galician Fishing Sector." *Disasters* 31 (2): 201–215. doi:10.1111/j.1467-7717.2007.01004.x.

Syafwina. 2014. "Recognizing Indigenous Knowledge for Disaster Management: Smong, Early Warning System from Simeulue Island, Aceh." *Procedia Environmental Sciences* 20: 573–582. doi:10.1016/j.proenv.2014.03.070.

Thurairajah, Nirooja, and David Baldry. 2010. "Women's Empowerment in Post Disaster Reconstruction: Perspectives on Policies and Frameworks." *International*

Journal of Strategic Property Management 14 (4): 347–361. doi:10.3846/ijspm.2010.26.

Tindall, Charlotte, and Katrien Holvoet. 2008. "From the Lake to the Plate: Assessing Gender Vulnerabilities throughout the Fisheries Chain." *Development* 51: 205–211. doi:10.1057/dev.2008.6.

Tran, Phong, Rajib Shaw, Guillaume Chantry, and John Norton. 2009. "GIS and Local Knowledge in Disaster Management: A Case Study of Flood Risk Mapping in Viet Nam." *Disasters* 33 (1): 152–169. doi:10.1111/j.1467-7717.2008.01067.x.

Vanem, Erik, Øyvind Endresen, and Rolf Skjong. 2008. "Cost-Effectiveness Criteria for Marine Oil Spill Preventive Measures." *Reliability Engineering and System Safety* 93 (9): 1354–1368. doi:10.1016/j.ress.2007.07.008.

Varela-Lafuente, Manuel, and Carlos Iglesias-Malvido. 2000. "Tendencias Y Problemas de La Pesca Gallega En El Contexto Mundial Y Comunitario." *Revista Galega de Economía* 9 (1): 1–27. http://www.usc.es/econo/RGE/Vol.9_1/Castel%E1n/Tendencias y problemas de la pesca gallega....pdf.

Veuthey, Sandra, and Julien-François Gerber. 2010. "Logging Conflicts in Southern Cameroon: A Feminist Ecological Economics Perspective." *Ecological Economics* 70 (2): 170–177. doi:10.1016/j.ecolecon.2009.09.012.

Viladrich-Grau, Montserrat. 2003. "Monitoring Policies to Prevent Oil Spills: Lessons from the Theoretical Literature." *Marine Policy* 27 (3): 249–263. doi:10.1016/S0308-597X(03)00004-6.

Viñas, Verónica. 2009. "Catástrofes Y Cambio de Políticas Públicas. Prestige Seis Años Después. Un Análisis de Marcos Interpretativos." *Revista Española de Investigaciones Sociológicas (Reis)* 127: 121–153.

Vizoso, Sonia. 2007. "El Gobierno admite que 'fue imposible sellar' todas las fugas del 'Prestige.'" *El País*. http://elpais.com/diario/2007/03/24/galicia/1174735090_850215.html.

Webler, Thomas, and Fabienne Lord. 2010. "Planning for the Human Dimensions of Oil Spills and Spill Response." *Environmental Management* 45: 723–738. doi:10.1007/s00267-010-9447-9.

Weeratunge, Nireka, Katherine A. Snyder, and Choo Poh Sze. 2010. “Gleaner, Fisher, Trader, Processor: Understanding Gendered Employment in Fisheries and Aquaculture.” *Fish and Fisheries* 11: 405–420. doi:10.1111/j.1467-2979.2010.00368.x.

Williams, Stewart. 2008. “Rethinking the Nature of Disaster : From Failed Instruments of Learning to a Post-Social Understanding.” *Social Forces* 87 (2): 1115–1138.

Wilson, Lisette, and Melanie G. Wiber. 2009. “Community Perspectives on Integrated Coastal Management: Voices from the Annapolis Basin Area, Nova Scotia, Canada.” *Ocean & Coastal Management* 52 (11): 559–567. doi:10.1016/j.ocecoaman.2009.08.008.

Wirtz, Kai W., Nick Baumberger, Susanne Adam, and Xin Liu. 2007. “Oil Spill Impact Minimization under Uncertainty: Evaluating Contingency Simulations of the Prestige Accident.” *Ecological Economics* 61: 417–428. doi:10.1016/j.ecolecon.2006.03.013.

Wisner, Ben, Greg Berger, and JC Gaillard. 2017. “We’ve Seen the Future, and It’s Very Diverse: Beyond Gender and Disaster in West Hollywood, California.” *Gender, Place & Culture* 24 (1): 1–10. doi:10.1080/0966369X.2016.1204995.

Xunta de Galicia. 2009. *Jornadas Sobre Criaderos, Semilleros Y Cultivo de Almejas*. A Toxa. http://mar.xunta.gal/sites/default/files/fileadmin/arquivos/cima/jornadas.pdf.

Zagonari, Fabio. 2008. “Integrated Coastal Management: Top-down vs. Community-Based Approaches.” *Journal of Environmental Management* 88 (4): 796–804. doi:10.1016/j.jenvman.2007.04.014.

Zhao, Minghua, Marilyn Tyzack, Rodney Anderson, and Estera Onoakpovike. 2013. “Women as Visible and Invisible Workers in Fisheries: A Case Study of Northern England.” *Marine Policy* 37: 69–76. doi:10.1016/j.marpol.2012.04.013

11. Annexes

Figure 37: Typical bulding of a fish auction

Annex I – The Interview guides

ENTREVISTA CON INFORMANTES EXPERTAS
Mariscadoras

GUIÓN

1. Cuál su historia personal con la pesca?
2. Cuál la historia de este grupo de mujeres en la pesca?
Puntos a tocar:
Cómo empezaron
Porqué pescaban
Cómo y cuando se reconocieron sus derechos laboral y previsional

3. Antes del accidente del Prestige, cómo era la zona?
Puntos a tocar:
Estado de conservación de las rías
Estado de los recursos pesqueros
Medidas de protección legal de la zona
Histórico de contaminación por petróleo (y otras fuentes de contaminación)

4. (También antes del accidente) Estabais preparadas para enfrentar un evento de contaminación por petróleo?
Puntos a tocar:
Organización
Sensibilidad hacia la contaminación por petróleo
Enfrentamiento de situaciones anteriores de contaminación por petróleo
Entrenamiento por parte de la administración pública o otros

5. Cuáles fueron los principales cambios que se dieron en la zona en el momento del accidente?
Puntos a tocar:
Efectos sobre las rías
Efecto sobre los recursos pesqueros
Efecto sobre la comunidad de pescadores
Perspectivas de futuro para la pesca

6. En aquel momento, cuáles fueron las principales consecuencias para las

pescadoras?
Puntos a tocar:
Efectos sobre la salud
Efectos sobre la familia
Efectos sobre la economía familiar
Perspectivas futuras como pescadoras

7. Cuál fue la reacción de las pescadoras ante el accidente?
Puntos a tocar:
Participación en la limpieza de las playas
Participación en las protestas
Participación dentro de la agrupación y/o otros grupos
Redes de apoyo comunitaria y/o extra-comunitarias

8. Después del Prestige, cómo describiría el estado de las rías en los últimos 10 años?
Puntos a tocar:
La calidad ambiental de las rías
El proceso de abundancia, escasez, mutaciones y/o desapariciones de especies
Posteriores casos de contaminación (por petróleo o no)

9. La contaminación del Prestige afectó a las pescadoras a largo plazo?
Puntos a tocar:
De qué manera y en qué medida

10. Cómo las pescadoras han reaccionado en los últimos años?
Puntos a tocar:
Cuanto a la conservación de las rías
Cambios en el manejo pesquero
Fortalecimiento del grupo
Incremento de la participación en los espacios públicos sobre el tema
Incremento de la presión en la administración pública para la protección de la zona

11. Habéis sido oídas alguna vez? Cómo ha sido la relación con la administración pública y correspondientes órganos relacionados a la pesca y/o a la protección ambiental? ¿Y con asociaciones ambientales, hubo algún diálogo?
Puntos a tocar:
Consulta a las pescadoras en el momento del accidente
Consulta a las pescadoras en el pos-Prestige, para la elaboración de una nueva política de protección costera
El auto-reconocimiento del grupo acerca de su conocimiento sobre el medio y su capacidad de aportar información

12. En un hipotético caso futuro de contaminación por hidrocarburos, las mariscadoras podrían ser incluidas en la gestión de la crisis? Vosotras podéis ofrecer soluciones?
Puntos a tocar:
El auto-reconocimiento del grupo acerca de su conocimiento sobre el medio y su capacidad de aportar información

13. Qué tipo de aprendizaje se lo llevan las pescadoras del accidente del Prestige?
Puntos a tocar:
En relación a la contaminación por petróleo: prevención y control
En relación a la organización y movilización social
En relación a la actuación política para mejorar la protección costera

14. Cómo funciona la agrupación de mariscadoras/percebeiras?
Puntos a tocar:
Autonomía y funcionamiento
La relación con la cofradía
El reconocimiento tanto en la sociedad como delante de las instituciones

15. Cómo desarrolláis la pesca actualmente?
Puntos a tocar:
La relación con las mareas
El manejo de las rías (sostenibilidad)
La organización del trabajo
El proceso de venta
El retorno económico
Innovación

ENTREVISTA CON INFORMANTES EXPERTOS
Representantes tercero sector

GUIÓN

1. Cuál es la importancia del marisqueo para Galicia?
Puntos a tocar:
Representación de la pesca artesanal frente a la industrial
Aspectos cultural, social, económico y ambiental
La cuestión de género: marisqueo = mujeres

2. Cuál era el estado de la zona antes del accidente del Prestige?
Puntos a tocar:
Estado de conservación de las rías
Estado de los recursos pesqueros
Histórico de contaminación por petróleo (y otras fuentes de contaminación)

3. Antes del accidente, cuál era el panorama de protección de la costa contra la contaminación por hidrocarburos?
Puntos a tocar:
Medidas de protección legal de la zona
Protocolos de seguridad
Existencia de plan de contingencia
Creación de espacios protegidos
Acciones espontáneas de la comunidad pesquera

4. (Dentro de lo que era la política de protección costera relacionada a la contaminación por hidrocarburo) Se previa algún mecanismo de participación pública para la prevención y recuperación del ambiente costero?

5. Las mariscadoras estaban preparadas para enfrentar un evento de contaminación por hidrocarburo?
Puntos a tocar:
Organización
Sensibilidad hacia la contaminación por hidrocarburo
Enfrentamiento de situaciones anteriores de contaminación por hidrocarburo
Entrenamiento por parte de la administración pública o otros

6. Cuáles fueron los principales cambios que se dieron en la zona en el momento del

accidente?
Puntos a tocar:
Efectos sobre las rías
Efecto sobre los recursos del marisqueo
Efecto sobre las comunidades de mariscadoras
Perspectivas de futuro para la pesca

7. Cuál fue el rol de las mariscadoras ante el accidente?
Puntos a tocar:
Participación en la limpieza de las playas
Participación en las protestas
Participación dentro de la agrupación y/o otros grupos
Redes de apoyo comunitaria y/o extra-comunitarias

8. Las mariscadoras fueron oídas alguna vez? Cómo ha sido la relación con la administración pública y correspondientes órganos relacionados a la pesca y/o a la protección ambiental?
Puntos a tocar:
Consulta a las pescadoras en el momento del accidente
Consulta a las pescadoras en el pos-Prestige, para la elaboración de una nueva política de protección costera

9. En los últimos 10 años, cómo describiría el estado de las rías?
Puntos a tocar:
La calidad ambiental de las rías
El proceso de abundancia, escasez, mutaciones y/o desapariciones de especies
Posteriores casos de contaminación (por hidrocarburo o no)
Nivel de vulnerabilidad

10. También en los últimos 10 años, qué cambios y avanzos han habido respecto al panorama de protección de la costa contra la contaminación por hidrocarburos?
Puntos a tocar:
Medidas de protección legal de la zona
Protocolos de seguridad
Existencia de plan de contingencia
Creación de espacios protegidos
Acciones espontáneas de la comunidad pesquera
Mecanismos de participación

11. Las mariscadoras, por su conocimiento del medio, podrían haber ofrecido

soluciones a la crisis? Y en un hipotético caso futuro, pueden ellas ofrecer soluciones?
Puntos a tocar:
El reconocimiento del grupo acerca de su conocimiento sobre el medio y su capacidad de aportar información

ENTREVISTA CON INFORMANTES EXPERTOS

Investigador 1

Perfil: conocimiento sobre las comunidades pesqueras en Galicia, pesca artesanal y el accidente del Prestige

GUIÓN

1. Cuál es la importancia del marisqueo para Galicia?

Puntos a tocar:

Aspectos cultural, social, económico y ambiental

Representación de la pesca artesanal frente a la industrial

La cuestión de género: marisqueo = mujeres

2. Cuál es la relevancia de las mariscadoras para la conservación del ambiente pesquero?

Puntos a tocar:

Mariscadoras y su conocimiento sobre el medio marino

Reconocimiento de las mariscadoras como gestoras ambientales

3. Cuál era el estado de la zona antes del accidente del Prestige?

Puntos a tocar:

Estado de conservación de las rías

Estado de los recursos pesqueros y de la pesca artesanal

Histórico de contaminación por petróleo (y otras fuentes de contaminación)

4. (Antes del accidente), cuál era el panorama de protección de la costa contra la contaminación por hidrocarburos?

Puntos a tocar:

Creación de espacios protegidos

Acciones espontáneas de la comunidad pesquera

5. Las mariscadoras estaban preparadas para enfrentar un evento de contaminación por hidrocarburo?

Puntos a tocar:

Organización

Sensibilidad hacia la contaminación por hidrocarburo

Enfrentamiento de situaciones anteriores de contaminación por hidrocarburo

Entrenamiento por parte de la administración pública o otros

6. Cuáles fueron los principales cambios que se dieron en la zona en el momento del accidente?
Puntos a tocar:
Efectos sobre las rías
Efecto sobre los recursos del marisqueo
Efecto sobre las comunidades de mariscadoras
Perspectivas de futuro para la pesca

7. Cuál fue el rol de las mariscadoras ante el accidente?
Puntos a tocar:
Participación en la limpieza de las playas
Participación en las protestas
Participación dentro de la agrupación y/o otros grupos
Redes de apoyo comunitaria y/o extra-comunitarias

8. Las mariscadoras fueron oídas alguna vez? Cómo ha sido la relación con la administración pública y correspondientes órganos relacionados a la pesca y/o a la protección ambiental?
Puntos a tocar:
Consulta a las pescadoras en el momento del accidente
Consulta a las pescadoras en el pos-Prestige, para la elaboración de una nueva política de protección costera

9. Cuáles fueron las principales lecciones del Prestige para la pesca y pescadoras artesanales?
Puntos a tocar:
Cambios sobre la gestión pesquera
Incremento de la preocupación ambiental
Presión sobre los gobiernos
Posibles estrategias adoptadas para enfrentar nuevas fuentes de contaminación

10. En los últimos 10 años, cómo describiría el estado de las rías?
Puntos a tocar:
La calidad ambiental de las rías
El proceso de abundancia, escasez, mutaciones y/o desapariciones de especies
Posteriores casos de contaminación (por hidrocarburo o no)
Nivel de vulnerabilidad

11. También en los últimos 10 años, qué cambios y avanzos han habido, respecto al panorama de protección de la costa contra la contaminación por hidrocarburos?

Puntos a tocar:
Medidas de protección legal de la zona
Protocolos de seguridad
Existencia de plan de contingencia
Creación de espacios protegidos
Acciones espontáneas de la comunidad pesquera
Mecanismos de participación

12. En un hipotético caso futuro de contaminación por hidrocarburos, las mariscadoras podrían ser incluidas en la gestión de la crisis? Pueden ellas ofrecer soluciones?
Puntos a tocar:
El reconocimiento del grupo acerca de su conocimiento sobre el medio y su capacidad de aportar información

ENTREVISTA CON INFORMANTES EXPERTOS
Investigador 2
Perfil: Conocimiento sobre el grupo de mariscadoras gallegas, su historia, sistema de organización, roles de género, relación con el medio marino y el accidente del Prestige

GUIÓN

1. Cuál es la importancia del marisqueo para Galicia?
Puntos a tocar:
Aspectos cultural, social, económico y ambiental
Representación de la pesca artesanal frente a la industrial
La cuestión de género: marisqueo = mujeres

2. Cuál es la historia de organización social de las mariscadoras?
Puntos a tocar:
Antes y después de las agrupaciones
El poder de voz de las agrupaciones dentro del universo pesquero y frente la administración pública

3. Cuál es la relevancia de las mariscadoras para la conservación del ambiente pesquero?
Puntos a tocar:
Mariscadoras y su conocimiento sobre el medio marino

Reconocimiento de las mariscadoras como gestoras ambientales

4. Cuál era el estado ambiental y social de la zona antes del accidente del Prestige?
Puntos a tocar:
Estado de conservación de las rías, estado de los recursos pesqueros y de la pesca artesanal
Estado de la organización social de las mariscadoras
Posibles canales de dialogo con la administración pública
Histórico de contaminación por petróleo (y otras fuentes de contaminación)

5. (Antes del accidente), tenían las mariscadoras la visión ambiental de su actividad? Era una preocupación de las mariscadoras la conservación de la costa?
Puntos a tocar:
Movimiento social hacia la conservación
Creación de espacios protegidos
Acciones espontáneas de la comunidad pesquera
Creación de asociaciones

6. Las mariscadoras estaban preparadas para enfrentar un evento de contaminación por hidrocarburo?
Puntos a tocar:
Organización
Sensibilidad hacia la contaminación por hidrocarburo
Enfrentamiento de situaciones anteriores de contaminación por hidrocarburo
Entrenamiento por parte de la administración pública o otros

7. Cuáles fueron los principales cambios que se dieron en la zona en el momento del accidente?
Puntos a tocar:
Efectos sobre las rías y recursos del marisqueo
Efecto sobre las comunidades de mariscadoras
Perspectivas de futuro para la pesca

8. Cuál fue el rol de las mariscadoras ante el accidente?
Puntos a tocar:
Participación en la limpieza de las playas
Participación en las protestas
Participación dentro de la agrupación y/o otros grupos
Redes de apoyo comunitaria y/o extra-comunitarias

9. Las mariscadoras fueron oídas alguna vez? Cómo ha sido la relación con la

administración pública y correspondientes órganos relacionados a la pesca y/o a la protección ambiental?
Puntos a tocar:
Consulta a las pescadoras en el momento del accidente
Consulta a las pescadoras en el pos-Prestige, para la elaboración de una nueva política de protección costera

10. Cuáles fueron las principales lecciones del Prestige para la pesca y pescadoras y pescadores artesanales?
Puntos a tocar:
Cambios sobre la gestión pesquera
Incremento de la preocupación ambiental
Presión sobre los gobiernos
Posibles estrategias adoptadas para enfrentar nuevas fuentes de contaminación

11. También en los últimos 10 años, qué visibilidad ha ganado las mariscadoras? Están incluidas en situaciones de gestión de crisis?
Puntos a tocar:
Mecanismos de participación
Dialogo con la administración pública

12. En un hipotético caso futuro de contaminación por hidrocarburos, las mariscadoras podrían ser incluidas en la gestión de la crisis? Pueden ellas ofrecer soluciones?
Puntos a tocar:
El reconocimiento del grupo acerca de su conocimiento sobre el medio y su capacidad de aportar información

Annex II – Publications resulting from thesis

1. FADIGAS, Amanda Braga de Melo. 2016. Reviewing Spanish legal framework for coastal protection through a gender perspective: An overview from the shellfisherwomen contributions to the Prestige disaster management." In *1st Tarragona International Environmental Law Colloquium*. *Rethink Sustainable Development in Terms of Justice*. Tarragona.

Reviewing Spanish legal framework for coastal protection through a gender perspective: An overview from the shellfisherwomen contributions to the Prestige disaster management

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Background

Women have demonstrated be an important partnership in environmental management due to their specific knowledge and strategies to create networks in community. In coastal areas their contributions cover scopes since resources management to combat contamination, the latter being a constant threat.

Regarding to this, oil spill is one of the most hazardous source of marine pollution. The Prestige disaster was one of the largest oil spill events in the world, mainly affecting Galicia coastal zone, in Spain.

As an invisible collective, shellfisherwomen had contributed decisively to restore Galicia coast through a gender view. They promoted a response combining elements of the "Ethics of care", unconditional cooperation and ocean protection.

Because states can not embrace the complexity of some disasters, should ensure a strong legal framework including the right to participate in disaster management.

Objective

This study will introduce the gender perspective to advance in the scenario of coastal protection regarding oil contamination, assessing the Prestige disaster

Methods

From the Prestige case, it was analyzed the current legal framework for coastal protection in Spain. In addition, it was combined qualitative coding methods to interpret deep interviews of 15 participants, amongst leaders and seniors shellfisherwomen (11), non-governmental environmental organization agents (02) and seniors researchers (02).

Results

The main findings showed that:

- The current legal framework is not adapted to the present social-environmental and technological challenges.
- There is a significant lack of mechanisms for participation and access to information.
- Although shellfisherwomen ignore the way to participate in legal changes, they believe that their knowledge and social abilities could contribute decisively in the management of a disaster provoked by an oil spill.

Main conclusion

The absence of a legal provision regarding participation invisibilizes and doesn't recognize the stakeholders in the recovery disaster, especially women's actions.

Therefore is indispensable raise decision making processes to discuss about legal mechanisms that could ensure women participation, and as a consequence highlight their role in coastal protection.

References

Agarwal, B. (2002). Gender Inequality, cooperation and environmental sustainability. In J-M. Baland; P. Barghan; S. Bowles (Eds.), Gender Inequality, cooperation and environmental sustainability (pp. 274-313). New Jersey, USA: Princeton University Press.

Fatusin, A., Afolabi, A, & Adetula, G. (2010). The impacts of oil and gas pollution on female gender in Ilaje, Niger Delta Region of Ondo State Nigeria. Journal of Human Ecology, 32(3), 189-196.

Fothergill, A. (1999). Women's roles in a disaster. Applied Behavioral Science Review, 7(2), 125-143. doi: 10.1016/S1068-8595(00)80014-8

Larruga, F., Pérez, M., & García, J. (2005). Las lecciones jurídicas del caso Prestige: diez tesis sobre la mejora de la seguridad del transporte marítimo y la protección del medio ambiente en España. Medio Ambiente & Derecho: Revista electrónica de derecho ambiental, 12(13).

Laxe, F. (Eds.). (2003). El impacto del Prestige: análisis y evaluación de los daños causados por el accidente del Prestige y dispositivos para la regeneración medioambiental y recuperación económica de Galicia. Coruña, España: Fundación Pedro Barrié de la Maza.

Moraes, M. (2003). Cidadania no feminino. In J. Pinsky & C. Pinsky (Eds.), História da cidadania (pp. 495-516). São Paulo, Brasil: Contexto

2. FADIGAS, Amanda Braga de Melo. 2014. Observando a los stakeholders olvidados: La aportación de las mujeres para la gestión de los desastres. In *XIV Colóquio Ibérico de Geografia*. p.1868-1874. Guimaraes.

Observando a los "stakeholders" olvidados: La aportación de las mujeres para la gestión de los desastres

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Resumen

En los diversos contextos de los desastres la imagen de las mujeres suele ser retratada con énfasis únicamente en su alta vulnerabilidad frente a los daños. Sin embargo, la literatura más reciente viene destacando su rol a la hora de desarrollar acciones de resiliencia. Estas acciones suelen quedar invisibilizadas y fuera de la pauta de actuación de los gobiernos y de las principales agencias responsables de gestionar las situaciones de crisis. En este trabajo inventariamos y presentamos evidencias de cómo mejorar la respuesta a una crisis insertando la perspectiva de género en la gestión de los desastres. Para ello realizamos una revisión de la bibliografía analizando la implicación de las mujeres y sistematizando los elementos principales de su acción de resiliencia frente a las distintas experiencias de gestión de los desastres.

Palabras clave: desastre, género, resiliencia, estrategias de afrontamiento

1. Introducción

Los desastres son un importante factor de riesgo a ser enfrentado por las sociedades en la actualidad. Sin embargo, sus efectos no exponen y afectan de igual manera a todos los grupos sociales, por eso cada grupo debe ser analizado aisladamente para avaluar el nivel de vulnerabilidad a que se enfrenta (Scharffscher, 2011).

Algunos estudios sobre desastre presentan a las mujeres como un grupo extremamente vulnerable (Becker, 2009; Childs, 2006; Eklund & Tellier, 2012; Enarson, 1998; Fothergill, 1999; Magaña Frade, Silva-Nadales, & Rovira Rubio, 2010). Se puede considerar que esta perspectiva es bastante reciente en la literatura y representa un importante logro, visto que provocó una apertura hacia una interpretación más heterogénea de los efectos de un desastre.

La vulnerabilidad de las mujeres es un hecho cada vez más demostrable en la literatura de desastre (Becker, 2009; Childs, 2006; Eklund & Tellier, 2012) y se relaciona

principalmente a su condición de género. Género será aquí entendido como actitudes y roles específicos atribuidos a cuerpos sexuados y que varían de acuerdo con condicionantes históricos, sociales y culturales (Agarwal, 2002; Moraes, 2003). Para Eklund & Tellier (2012) aunque el concepto de género no explique todas las relaciones de poder e iniquidades entre los sexos, este factor combinado con otros, como el económico, la raza y otros, provoca una condición social peligrosa que coloca a las mujeres de diferentes grupos en diferentes situaciones de riesgo (Enarson, 1998), a esto denominamos vulnerabilidad de género.

Sin embargo, los estudios suelen restringirse a esta temática sin destacar el rol de las mujeres como promotoras de acciones de resiliencia (Childs, 2006; Fothergill, 1999). Éstas con frecuencia son fruto de la experiencia y del ingenio, mucho más que de la tecnología, por lo cual suelen estar invisibilizadas y alejadas de la pauta de actuación de los gobiernos y de la toma de decisiones de las principales agencias de respuesta humanitaria (Childs, 2006; Ganapati, 2012; Scharffscher, 2011), aunque en muchas ocasiones las mujeres actúen de modo inmediato ocupando la vanguardia en las acciones de socorro y reconstrucción (Enarson, 1998; Ganapati, 2012; Hamilton & Halvorson, 2007).

En este trabajo inventariamos y presentamos evidencias de cómo mejorar la respuesta a una crisis insertando la perspectiva de género en la gestión de los desastres.

2. Metodología

Primeramente buscamos datos relativos a desastre y vulnerabilidad. A partir de estos temas centralizamos la búsqueda en acciones de resiliencia y género. Este fue el pilar temático que se construyó exclusivamente con fuentes secundarias de la literatura académica. Las publicaciones analizadas fueron identificadas por medio de bases de datos on line. Para el cribado de los datos hemos vinculado a la búsqueda las palabras clave *women participation, women roles, disaster response, gender vulnerability* y *disaster management.*

Basándonos en la literatura seleccionada, hemos buscado elementos acerca de la implicación de las mujeres en distintas situaciones de desastre. A continuación sistematizamos los principales elementos de su acción de resiliencia. Para el análisis de los datos adoptamos la perspectiva de Fothergill (1999), Childs (2006) y Agarwal (1992, 2010) que se fundamenta en revelar el espacio privado como una importante esfera de actuación de las mujeres y la inserción de éstas en la gobernanza dentro del espacio público.

3. Resultados

Fueron revisados 14 artículos que hacían referencia a las mujeres en situación de desastre natural o tecnológico. De estos, apenas 5 relataron experiencias directas de acciones de resiliencia llevadas a cabo por mujeres. Los demás se limitaron a la temática de la vulnerabilidad o a citar ejemplos de experiencias sin especificar datos o informaciones concretas.

Profundizamos en el análisis de los artículos de Fothergill (1999), Ganapati (2012), Hamilton & Halvorson (2007), Magaña Frade et al. (2010) y Scharffscher (2011) por abordar una análisis detallada de experiencias directas, utilizando principalmente datos de fuentes primarias.

Cuando analizamos las acciones de resiliencia citadas en cada texto vimos que éstas seguían un patrón común independientemente del tipo de desastre, tal como la clasificación propuesta por (Enarson, 2000), que divide en tres categorías las labores realizadas por mujeres en a una situación de desastre.

La primera sería la de los Trabajos Reproductivos, lo que incluye actividades realizadas en el ámbito doméstico relacionadas al cuidado material y psicológico de sus familiares. La segunda, los Trabajos Productivos, implica en las labores realizadas desde un rol profesional, como médicos y trabajadoras sociales, o a través de la producción de bienes para la familia, como por ejemplo la siembra de cultivos. La última categoría, los Trabajos Comunitarios, dice respeto a acciones volcadas para la recuperación y fortalecimiento del tejido social. Las acciones de resiliencia encontradas en los textos fueron analizadas y clasificadas conforme la propuesta de (Enarson, 2000), como presentamos en la Tabla I.

Tabla I– Acciones de resiliencia llevadas a cabo por mujeres en situación de desastre.

Autor	Lugar y año	Tipo de desastre	Clasificación de las acciones de resiliencia según (Enarson, 2000)	Acciones de resiliencia
(Fothergill, 1999)	Grand Forks (EUA), 1997	Inundación	Trabajo Reproductivo	Cuidado y suporte emocional de niños y ancianos
			Trabajo Comunitario	Participación en la construcción de barreras con bolsas de arena Preparación de comida para los y las cargadoras de bolsas de arena Organización y suporte en los centros de evacuados Préstamos de bienes a vecinos afectados
(Ganapati, 2012)	Gölcük (Turquia), 1999	Terremoto	Trabajo Comunitario	Organización de una network entre y para mujeres

(Scharffscher, 2011)	Batticaloa (Sri Lanka), 2004	Tsunami	Trabajo Comunitario	Organización de una network entre mujeres Visibilización de grupos de personas negligenciadas antes, durante y después de un desastre
(Hamilton &Halvorson, 2007)	Kashmir (Pakistan), 2005	Terremoto	Trabajo Comunitario	Rescate de víctimas Primeros auxilios Reconstrucción de casas y de la comunidad Recuperación de las actividades escolares
			Trabajo Productivo	Creación de centros de artesanía
(Magaña Frade et al., 2010)	Maule y Bío-Bío (Chile), 2010	Terremoto y Tsunami	Trabajo Reproductivo	Reconstrucción de la vida cotidiana familiar
			Trabajo Comunitario	Articulación con las autoridades e instituciones locales y nacionales

4. Discusión

El porqué del trabajo de las mujeres quedarse invisibilizado pasa por entender que, aun en sociedades industrializadas, las mujeres desarrollan sus actividades principalmente en el ámbito privado, en especial ejecutando tareas que dicen respecto a la cura de niños y ancianos, como de la propia administración de la casa. Pero también, al ejercer tareas en la esfera pública sus acciones son relegadas a un según plan y tachadas como meras ayudas o faltas de relevancia práctica. Este panorama también se aplica a los contextos de desastre.

Pese a esto las mujeres suelen ser las primeras a socorrer a sus familias y, en otros casos, a gestionar medidas en su comunidad para que superen la crisis instalada por una situación de desastre. Por sus características, las acciones llevadas a cabo por las mujeres ofrecen respuestas propias, con un alto grado de eficacia y aplicables a distintas esferas. Los roles que asumen se relacionan directamente con la dicotomía basada en el género, separando radicalmente el espacio público del privado (Agarwal, 1992, 2010; Childs, 2006; Fothergill, 1999).

De los artículos analizados, Fothergill (1999) y Magaña Frade et al. (2010) destacan los Trabajos Reproductivos realizados por las mujeres para restablecer el orden en sus espacios privados. En ambas publicaciones encontramos ejemplos de cómo las acciones de resiliencia se dirigieron hacia la protección de sus grupos familiares, incluyendo el mantenimiento alimentar, el apoyo emocional o la reconstrucción de sus hogares. Para las mujeres la destrucción del hogar, modifica su relación con otros stakeholders dentro de la sociedad, ya que se vuelve en un factor que motiva una

conducta más activa y hasta incluso combativa para lograr una mejoría en la calidad de vida de sus famílias (Enarson, 1998; Scharffscher, 2011; Magaña Frade et al. 2010).

Aunque las mujeres sean históricamente recordadas – o mejor dicho, estereotipadas - por su Trabajo Reproductivo hay una paradoja que invisibiliza éstas funciones. Se da por hecho que los hogares se reconstruirán sin tener en cuenta los conocimientos y recursos necesarios para lograrlo y sobretodo quien lo gestiona. Esta conducta es muy común en los órganos y agencias que manejan la respuesta a la crisis (Childs, 2006; Enarson, 1998; Scharffscher, 2011; Silverstein, 2008).

Los Trabajos Productivos fueron mencionado apenas por un artículo. Hamilton (2007) puntúa que en el pos-terremoto en Kashmir las mujeres volcaron esfuerzos para promover centros de artesanía que pudiesen aumentar los ingresos de las familias afectadas.

A su vez, los Trabajos Comunitarios fueron muy bien relatados en todos los artículos analizados, a pesar de ser algo escaso en la literatura de desastre. En un primer momento se destacan tareas como el suministro de alimentos para los equipos de socorro o la prestación de primeros auxilios, lo que está también muy relacionado a los Trabajos Reproductivos, pero hecho de cara a la esfera pública. Sin embargo, encontramos otras labores menos comunes, éstas se podrían caracterizar como labores de fuerza física y labores de gestión estratégica.

Las labores de fuerza física contrastan con la idea de fragilidad atribuida a las mujeres. La situación atípica provocada por una crisis posibilita que ciertos roles de género se rompan, y así se crea el escenario ideal para que las mujeres pasen a ejercer tareas culturalmente relacionadas a los hombres (Fordham, 1998; Fothergill, 1999; Hamilton & Halvorson, 2007). Sea en el caso del terremoto en Kashmir (Hamilton & Halvorson, 2007), donde las mujeres actuaron de modo espontaneo y organizado cavando entre los escombros en búsqueda de supervivientes, o durante la pos-inundación en Grand Forks (Fothergill, 1999) cuando se sumaron a la construcción de barreras cargando bolsas de arena, las mujeres rompieron con la imagen a la cual se les ha asignado. Aunque hay que destacar que no siempre estos nuevos roles fueron bien vistos dentro de la comunidad, muchas veces hubo el rechazo social como también la invisibilidad (Fordham, 1998).

Pero sin lugar a duda las labores de gestión estratégica se resaltan como las acciones de menor visibilidad. Primero porque las mujeres no son reconocidas públicamente como gestoras (Childs, 2006). La idea de criar y ejecutar estrategias está fuertemente vinculada como perteneciente al universo masculino, como apunta Ganapati (2012). Sin embargo, las mujeres sobresalen creando redes de conocimiento e intercambio de auxilio mutuo que se construyen lejos de cualquier formalidad o reglamentación.

Estas redes sumergidas se revelan y se fortalecen a medida que se presenta una situación de cambios drásticos en la sociedad, como los desastres. Fothergill (1999) nombra a estas redes de "cola social" que mantiene la comunidad unida. A través de estas redes de trabajo colectivo las mujeres son capaces de orientar a los planeadores y administradores de las crisis sobre las necesidades más básicas del colectivo al cual pertenecen. Al mismo tiempo generan confianza en su tejido social para que se logre el trabajo en conjunto con las agencias de respuesta (Magaña Frade et al., 2010; Scharffscher, 2011).

5. Conclusiones

Este artículo ha tratado de presentar un panorama de la gestión de los desastres desde una perspectiva de género, fundamentada en la revisión bibliográfica. Analizamos acciones de resiliencia ejecutadas por mujeres en diferentes contextos de desastres, contribuyendo para visibilizar las aportaciones de este grupo a la mitigación de los efectos de una crisis. A partir de los resultados concluimos que las evidencias demuestran que si las mujeres son consultadas sobre sus necesidades y puntos de vista se aumenta la probabilidad de éxito en las labores de los gobiernos y de las organizaciones de ayuda humanitaria.

6. Referencia bibliográfica

Agarwal, B. (1992). The Gender and Environment Debate: Lessons from India. *Feminist Studies*, *18*(1), 119–158.

Agarwal, B. (2002). Gender inequality, cooperation, and environmental sustainability. In *Inequality, cooperation, and environmental sustainanility* (pp. 274–313).

Agarwal, B. (2010). *Gender and Green Governance: The Political Economy of Women's Presence Within and Beyond Community Forestry* (p. 516). Oxford University Press.

Becker, S. M. (2009). Psychosocial care for women survivors of the tsunami disaster in India. *American Journal of Public Health*, *99*(4), 654–8. doi:10.2105/AJPH.2008.146571

Childs, M. (2006). Not through women's eyes: photo-essays and the construction of a gendered tsunami disaster. *Disaster Prevention and Management*, *15*(1), 202–212. doi:10.1108/09653560610654347

Eklund, L., & Tellier, S. (2012). Gender and international crisis response: do we have the data, and does it matter? *Disasters*, *36*(4), 589–608. doi:10.1111/j.1467-7717.2012.01276.x

Enarson, E. (1998). Through Women's Eyes: A Gendered Research Agenda for Disaster Social Science. *Disasters*, *22*(2), 157–173. doi:10.1111/1467-7717.00083

Enarson, E. (2000). Gender issues in natural disasters: talking points and research needs ILO. In *InFocus Programme on Crisis Response and Reconstruction Workshop, Geneva*. Retrieved from http://online.northumbria.ac.uk/ geography_research/gdn/resources/ilo-talking.doc

Fordham, M. H. (1998). Making women visible in disasters: problematising the private domain. *Disasters*, *22*(2), 126–43. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/9654812

Fothergill, A. (1999). Women's roles in a disaster. *Applied Behavioral Science Review*, *7*(2), 125–143. doi:10.1016/S1068-8595(00)80014-8

Ganapati, N. E. (2012). In Good Company: Why Social Capital Matters for Women during Disaster Recovery, *72*, 419–427. doi:10.111/j.1540-6210.2012.02526.x.Why

Hamilton, J. P., & Halvorson, S. J. (2007). The 2005 Kashmir Earthquake. *Mountain Research and Development*, *27*(4), 296–301. doi:10.1659/mrd.0945

Magaña Frade, I., Silva-Nadales, S., & Rovira Rubio, R. (2010). Catástrofe , subjetividad femenina y reconstrucción : aportes y desafíos desde un enfoque de género para la intervención psicosocial en comunidades afectadas por el Terremoto. *Terapia Psicológica*, *28*(2), 169–177.

Moraes, M. L. Q. de. (2003). Cidadania no feminino. In *História da Cidadania* (pp. 495–516).

Scharffscher, K. S. (2011). Disempowerment through disconnection: Local women's disaster response and international relief in post-tsunami Batticaloa. *Disaster Prevention and Management*, *20*(1), 63–81. doi:10.1108/09653561111111090

Silverstein, L. M. (2008). Guidelines for Gender-Sensitive Disaster Management, *16*(31), 153–158.