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The economic analysis of maritime catastrophes in sensitive areas: the assessment and calculation of damages in the environment and population's way of life

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ABSTRACT

Maritime transport is not only one of the safest ways to move dangerous freight it is also one of the most profitable from the economic point of view. Despite this, accidents are inevitable and sometimes become in catastrophes. There are some geographical locations where these accidents or disasters are repeated frequently and then can be considered "black spots", this is the case in the northwest of Spain: Galicia, where maritime disasters are frequent. The last one, starring the Prestige has involved extensive damage from the environmental point of view and has endangered environment sustainability and even the population style of life. This study is evaluating the effects of disaster and the resilience of the environment and the population. The maritime disasters, repeated over time, attack the local way of life from the point of view of the economic and environmental aspects, and also generate feelings of helplessness and lack of confidence in the institutions responsible for general environmental safety and particularly for sea. The findings indicate that it is necessary to create institutional mechanisms preventive by means of clearly specified rules and controls, together with the identification of agencies responsible for development and execution of proposals, able to generate confidence in the local population and respond appropriately to prevent potential disasters.

1. Introduction

Globalization has encouraged the growing integration of the different economic areas, the development of the international trade; the best transport infrastructures make flows of goods and services easier. Maritime transport is part of the economic globalization process, especially when it comes to carrying commodities as hydrocarbons and dangerous products. The increase of maritime traffic of dangerous goods has shown the most risky exposed navigation areas, but some of them are in what it could be called "vulnerability", understood as the relative tendency a system has to suffer accidents that could generate significant transformations, either structural or permanent, and deep changes, not only from an environmental point of view, but also from the style of life of the resident population.

There have been lots of papers analyzing environmental aspects for maritime catastrophes, but only a few of them deal with the changes on lives of the people involved, directly or indirectly, in these catastrophes. Galicia is a Region located in Spain, North West region, and, unfortunately, known abroad due the periodical accidents occurred on its coast. It is not by accident that the Fisterra (The End of the land) code is in the "Costa da Morte" District (Coast of the Dead), one of the most beautiful places, with plenty of environmental treasures, in Galicia. The last bulk ship accident in this coast was the Prestige, which was classified as one of the most important catastrophes in the world. Nevertheless, Maritime Transport is not only one of the safest ways to move dangerous freight, but also one of the most profitable from an economic point of view. Despite this, accidents are unavoidable and sometimes become catastrophes. There are some geographical locations where these accidents or disasters occur frequently and that can be considered "black spots", this is the case in the northwest of Spain: Galicia, where maritime disasters are frequent. The last one,

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starring the Prestige, in 2002, has involved extensive damage from an environmental point of view and has endangered environment sustainability and even population's lifestyle.

In the last decades, the studies related to marine conservation moved their focus to the complexity of coupled environmental–human systems (Bigagli, 2015). Maritime systems can be thought of as comprising the interaction of two subsystems: the biophysical and the human (Perry et al., 2010). Literature shows the close link between marine ecological and human systems, as interactive, with such interdependence that creates feedback loops, whose effects are difficult to predict and measure (Bigagli, 2015; Hughes et al., 2005; Perry et al., 2010). The socio-ecological marine systems, should be concerned, from regional and local responses, about socio-economic development, economic bases, demographic and cultural features, among others (Perry et al., 2010).

Two aspects are main focuses for this paper: the analysis of the effects of Prestige's disaster on normal lives of population, towards normative environmental and institutional actuations to prevent and avoid the maritime contamination due to catastrophes, and the analysis of the economic activity of Galicia and its relation with population's way of live, because, maritime security is closely related to economic development (Bueger, 2015). In this paper the effects of the Prestige disaster are analyzed, from the point of view of people's feelings and way of life of the population. For example, the normative framework changes are, for sure, a clear consequence of the Prestige's disaster. It has paid particular attention to fishing and tourism, as a way of earning their living, but also to demographic issues, people feelings and other related questions that are also taken into account, because all of them are the ones that draw the population's lifestyle, day by day. For achieving our goal, there have been used researches made by the Galician Statistics Institute, at Municipality level, that is the lowest that this Institute supplies. The chronological time is the one that goes from the date of the disaster (November 2002) to nowadays. The possible differences between the municipalities are analyzed, from the point of view of the level of affectation of the fuel spilled.

2. Maritime catastrophes and regions affected: maritime disaster in Galicia: the Prestige and resilience of population and environment

On Wednesday, November 13, 2002, an oil tanker 26, sent an SOS 50 miles from Finisterre (Galicia-North West Spain). It was the beginning of the greatest ecological disaster in the history for Galicia. The coup opened a leak in starboard of two empty tanks and brought a heeling 25 °. An hour later, 24 crew members were evacuated by two helicopters, Captain Maguras, the first officer and the chief engineer remained on board. At Five O'Clock in the Afternoon the oil tanker begins to expel its cargo of fuel oil M-100, PHN one of the most toxic petroleum derivatives.

The Prestige, single hull oil tanker, was built in Japan in 1976, Greek registration and sailing under the flag of Bahamas. It was vetoed by the Spanish association of petroleum product. In 1999 it had been sanctioned in New York and Rotterdam by two security flaws. The vessel avoided entering the ports of the European Union. It had left Riga (Latvia), bound for Singapore, after a stopover at Gibraltar. It was loaded with 77,000 tons of fuel oil, valued at 60 million euros. At the end of Wednesday, the ship had lost about 6000 tons of fuel. The stain was 6.2137 mi (10 km) long and 0.18641 mi (300 m) wide. The Spanish government decided to move the vessel away from the coast, and informed that everything was under control. The storm continued, the ship was shifted (see Fig. 1) initially to the north and then west. The hull breach was becoming increasing. On Saturday November 16th the oil spill reached the shore and polluted 118.06 mi (190 km) of coastline. At 8:50 am on Tuesday November 19, 2002, the Prestige sank down, 161.56 mi (260 km) of Galician coast, and a depth of 11,483 ft (3,500 mt) in abyssal waters. There, the temperature was 36.140 °F (2.3 °C), which made hope for the 66,000 tons of fuel that remained inside the boat could get solidification, but it didn't.

In Galicia the citizen movement “Nunca Máis” (Never Again) emerged and, outside Spain, harsh words were heard: Chirac (the President of French Republic) spoke of “incapacity” of the European Union to avoid maritime disasters and declared that he was “appalled” by the oil slick splashing Galicia. The New York Times wrote that the Galician disaster could be greater than that caused the Exxon Valdez in Alaska in 1989. In England, The Guardian asked “Do you have a sticky problem?: Do not worry, you can pour it off the African coast”. Although there was no anti-pollution vessel in Spain, the government rejected offers of assistance from Germany, Italy and Britain. However, civil society was mobilized, to alleviate the disaster: the “white tide” appeared (La Voz de Galicia, 2002). In the past 30 years, Galicia, the region most dependent on the sea of the European Union, has suffered seven of the eleven major water disasters in Europe. Some 300,000 oil Tones have degraded the Galician coast in recent decades. The Prestige, affected more than 500 km of coastline, including both, French and Portuguese coasts.

2.1. Could the history of the Prestige be repeated? What have we learnt from the past?

Industrial development and growth of trade, has boosted the oil companies to get rid of their fleets and then, some independent smallholders have arisen and they have flagged their vessels in open registry countries. At the same time, developed countries have provided the so-called “second registers” (with minor requirements) of their fleets in order to achieve for a significant number of their vessels. The quality and age of the vessels carrying dangerous goods or capable of causing marine pollution were not the main concern of states neither of international organizations. There were not enough controls, nor an international legislation assumed by all countries in order to establish prevention criteria for that type of traffic. The international institutional framework was not able to design regulatory systems to avoid, alleviate and mitigate the negative impacts of risks. It was from the Erika accident (December, 1999) when the Spanish and EU regulations began to develop measures to anticipate, prevent and reduce negative impacts. In other words, the EU reacts only after disasters. The policy packages (Erika I: March 21, 2000); Erika II (December 6, 2000) and Erika III, (November 23, 2005) were including new sections in the light of the demands of civil society and people affected as a result of accidents. Then there is a tendency to mitigate, but not eliminate “bad practices” still prevailing. In times of scarcity of accidents, there is not developed a new legislation. However, international conventions (Civil Liability Convention, approved on 1992 and IOPC Funds, approved on 1992) on financial compensation are very limited: the amounts are not sufficient, do not include some of the negative impacts, prompt compensations are not assured, they usually generate strong disputes between administrations and those affected. And they only act after another new accident. A summary of the maritime regulations and its origin related to maritime disasters is on Table 1.

Galicia experienced a total of 7 accidents on its shores since 1970: 1970, Erkowitz (pesticides); 1970 Policommander (petroleum); 1976 Urquiola (petroleum); 1978, Andros Patria (petroleum); 1987, Casson (chemicals); 1992 Aegean Sea (petroleum); 2002 Prestige (fuel). It is the European region with the highest number of accidents. In proximity to an area of sea passage (runner Finisterre) and the European region with the highest level of fishing