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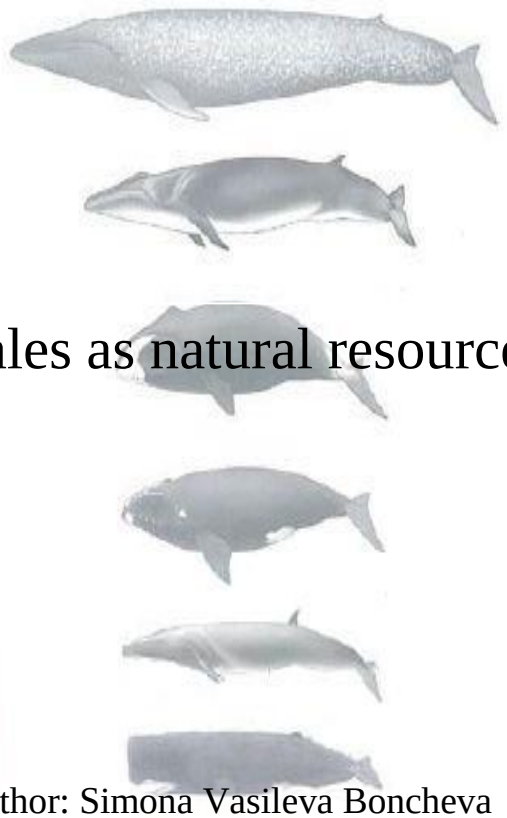

Whales as natural resources

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ABSTRACT

Contemporary, the whaling issue is one of the most topical debates attracting the international public attention. The polemic of whether whales should to be utilized in the fishing industry or only non-lethal utilization to be allowed has its allies and opponents.

In this respect, this master thesis seeks to analyze the ten species of order cetacean, referred with the common name "great whales", as natural resources and consider the economical forces which affect their exploitation.

The analysis is carried out applying the Hecksher- Ohlin proposition for production specialization and pattern of trade based on the factor endowments of the trading countries. While the study proves that countries with relatively abundant population in their territorial waters specialize in the hunting of whales and production of whale-derived products, the prediction for gain from trade do not hold when applied to natural resources with open access problem. This phenomenon, also known as "the tragedy of common" (Hardin, 1968), is the underlying reason for the collapse on the global whales stock in the middle of 20th century. The thesis examines the domestic policies and trade tools which correct this problem and prevent the resources from depletion.

The theory is applied to the three whaling (Japan, Iceland and Norway) and one non-whaling countries -United States, which is in the forefront of the anti-whaling movement. The empirical investigation shows whether different domestic policies and trade measures help for the conservation of the species or on the contrary trigger their depletion. The results demonstrate that if the respective domestic regulations and trade instruments are put into practice correctly the reduction of renewable natural resources (whales) will not occur. The thesis concludes with further recommendations for alternative measures which correct the open access problem on international level.

As contribution to the existing literature this analytical framework is suitable for application in the study of other endangered species.

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LIST OF ABBREVIATIONS

AEWC	**Alaska Eskimo Whaling Commission**
AWI	**Animal Welfare Institute**
BWU	**Blue Whale Unit**
CITES	**Convention for International Trade with Endangered Species**
EBFM	**Ecologically-Based Fishery Management**
EEZ	**Exclusive Economic Zone**
EFTA	**European Free Trade Association**
ESA	**Endangered Species Act**
EU	**European Union**
FARF	**Fishery and Aquaculture Research Fund**
FAO	**Food and Agriculture Organization of the United Nations**
GATT	**General Agreement on Tariffs and Trade**
GDP	**Gross Domestic Product**
GFTs	**Government Financial Transfers**
ICR	**Institute for Cetacean Research of Japan**
ICRW	**International Convention for Regulation of Whaling**
IFAW	**International Fund for Animal Welfare**
IRO	**Icelandic Review Online**
ISK	**Icelandic krona**
ITQ	**Individual Transferable Quota**
IUU	**Illegal, unregulated and unreported fishing/whaling**
IVQ	**Individual Vessels Quotas**
IWC	**International Whaling Commission**
JFA	**Japanese Fishery Agency**
MFN	**Most Favored Nation tariff**

MMPA	**Marine Mammal Protection Act**
MRI	**Marine Research Institute of Iceland**
NAMMCO	**North Atlantic Marine Mammal Commission**
NMP	**New Management Procedure**
NOAA	**National Oceanic and Atmospheric Administration**
NOK	**Norwegian Krone**
OECD	**Organization for Economic Co-operation and Development**
RMS	**Revised Management Scheme**
TAC	**Total Allowable Catch**
USA	**United Stated of America**
USD	**United States dollar**
USSR	**Union of Soviet Socialist Republics**
WTO	**World Trade Organization**

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INTRODUCTION

Within last few years, the whales' issue received great attention from the world public not only because of its ethic dimensions and ecological impact but also because of the problems pertaining to natural resources which it embodies. After decades of uncontrolled overexploitation of the global whales stock a halt on commercial whaling was imposed in 1986. Even though the moratorium is still in force today, the debate over whaling is "fiercely contended and is now one of the world's most high-profile environmental issues" (Bowett and Hay, 2009).

Where does this interest in the fate of whales come from? The phenomenon involves aspects from different socioeconomic processes inherent to the modern society:

The contemporary trends toward sustainable management of marine living resources- after years of unwise use of the planet living resources, many species were driven to the verge of extinction. For the importance of this topic speaks the fact that year of 2010 was declared for International Year of Biodiversity by the United Nation General Assembly. As Dr. Norbert Röttgen, Minister of the Environment of Germany points, this pronouncement will increase the awareness for the number of dangers biodiversity faces and integrate the issue in international, nationwide and area-specific policies. "*The loss of biological diversity stands alongside climate change as one of the most pressing areas of global policy, and is thus one of the crucial challenges of our time*".

Post-war tendencies for environmental protection- Inglehart (1977) explains the development of new ideals for non-consumptive use of natural wealth as "post-materialism". According to his thesis, altruistic values and the needs for personal and intellectual advancement are gradually supplanting the value for material satisfaction, mainly because new generations rose in relative affluence and security thus replacing old generations which experienced the economic hardship and insecurity of the wars. In this respect Scheffer (1991) writes: "caring about whales is a mark of personal and societal maturity; and it is good practice in caring: the most difficult assignment of Homo sapiens climbing toward humanity".

Conflicting cultural values- the environmental movements and in particular, anti-whaling campaigns, are carried out in the light of Western cultural doctrine, without

respect to the traditions and subsistence needs of different whaling communities (Wenzel, 1991). The "Save the Whales" movement has its rational foundation in the non-whaling countries where marine mammals have rather symbolic images. Kalland (1992) explains that, because in the western culture whales are not utilized for food or any other commodity, the negative outcome of such campaigns do not harm the welfare of developed world as it does not deprive the society from the comfortable use of everyday goods.

The genesis of "super-whale" – Kalland (1992) continues that marine mammals enjoy number of characteristics which contribute for the great potential of whales as a symbol to the urban society. The less we know about different species, the more is left to our imagination: "In summary, we are told that the whale is the largest animal on earth (this applies to the blue whale), that the whale has the largest brain on earth (the sperm whale), that the whale has a large brain to body weight ratio (the bottlenose dolphin), that the whale has a pleasant and varied song (the humpback), that the whale is friendly (the gray whale), that the whale is endangered (the bowhead and blue whales), and so on. By talking about the whale, an image of a single whale possessing all of these traits emerges. But such a creature does not exist. It is a mythic creation - a "super-whale," which has come to represent all species of cetaceans." In this framework, whaling is described as slaughter (Hall, 1988) while whale-watching is frequently presented as "the economic and moral antithesis of whaling" (Evans, 2005).

However, this master thesis does not advocate any of the ideas proclaimed by either pro- or anti-whaling movements.

Statement of the problem

The goal of this master thesis is to explain the qualification of the "great whales" as marine renewable resources and the economic forces which govern the harvest and trade with whale-derived products. It presents the problems of overexploitation inherent for the fishery resources in situations where property rights are poorly defined.

Methodology

Using Heckscher- Ohlin theory for the gains from trade created from countries' specialization in factor endowed industries, it will be analyzed whether different domestic policies and trade measures facilitate conservation of endangered species or on the contrary- accelerate their extinction. It will be seen that the traditional assumptions

for the advantages from free trade under the classical and neoclassical trade frameworks do not hold when applied to renewable natural resources with open access problem. It will be analyzed what remedies on national and international level could be undertaken in order to restore the healthy continuation of whales population and enable sustainable use of cetacean resources.

Motivation

Although whales are marine mammals, as a natural resource they are regarded part of the fishery sector, therefore share the same management practices and problems. Moreover, the theoretical framework in which whaling and whale conservation are analyzed is applicable for many other species subject to overharvesting. For that reason the possible solutions which will be given consequently in the thesis can be applied to other human activities, such as sealing (hunting of seals) and shark finning (removal and retention of shark fins and discarding the carcass at sea) which have adverse effect to biodiversity. Also, the problem is worth analyzing because, as members of the modern society, we must be concerned with the wellbeing of the future generations, as they have the same rights to enjoy and benefit from biodiversity as we do today. Presenting an alternative view on how the human actions affect the existence of cetaceans, the thesis may serve as a base for environmental policies and conservation programs of governments, agencies and nonprofit organizations.

Structure of the thesis

The thesis is divided in theoretical and empirical part. Part I makes an introduction to the topic, giving short historical overview of whaling and explaining the context in which whales are treated as resources. The theoretical part is presented in Part II where Heckscher-Ohlin theory is applied to trade with natural resources. It is also explained how the negative externality known as “tragedy of common” leads to depletion of renewable natural resources. Part III is the empirical part where it is analyzed the impact different domestic and trade policies of the whale-catching countries and one non-whaling county have on the whales’ stocks.

PART I WHALING AND WHALES RESOURCES- PROLOGUE

In this part an introduction to the topic will be made. Section 1 starts with basic features of whales as biological species. Section 2 continues with brief history of whaling from the very beginning to our day. This overview is essential due to the fact that whale hunting is the mean by which whales have been utilized as resources for first time. The main international agreements that rule the harvesting and trade with whale products are presented in Section 3. Follows Section 4 where whales will be described in terms of consumptive and non-consumptive values which they convey for the modern society.

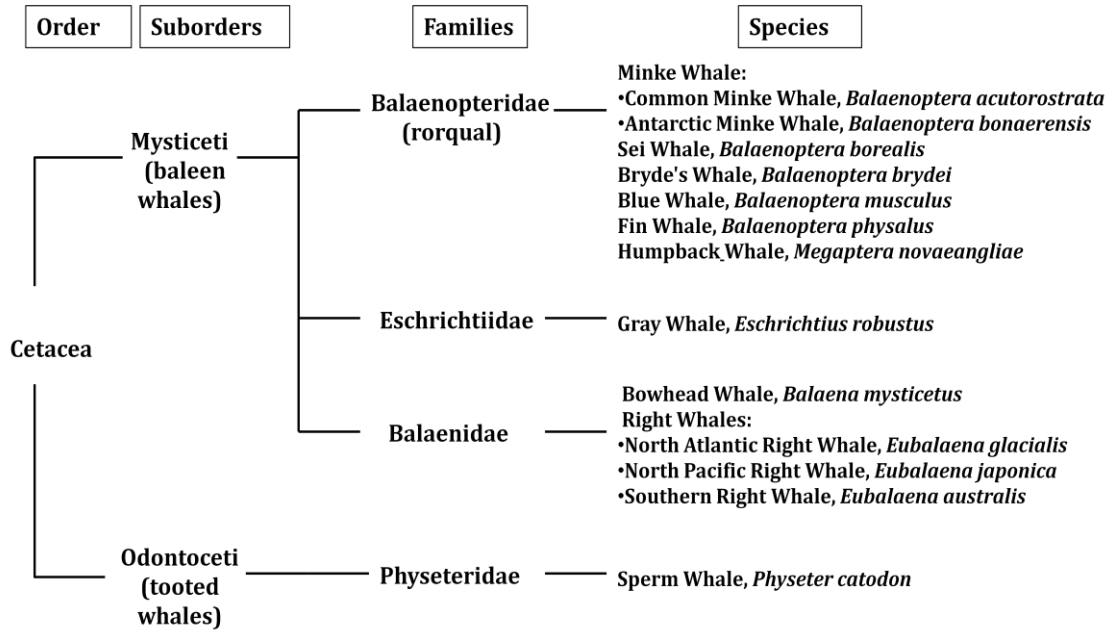
1. Whales as biological species

"Whales" is an umbrella term generally used to describe all the species belonging to mammalian order Cetacea, i.e. whales (*Mysticeti),* dolphins (*Odontoceti*) and porpoises (*Phocoenidae*)[1]. Although the word cetacean refers to all the species in this order, here it will be used interchangeably with whales. This studies focus on ten species, commonly known as "great whales". The name comprises all baleen whales and one toothed whale- the sperm whale (Figure 1 below). Distinctive for these species is their great size, ranging from 8m long (9 tons weight) mink whale to up to 33m (150 ton weight) blue whale- the biggest living creature on Earth. Although, they are adapted to live entirely in aquatic environment, they breathe aerobic and nurse their offspring with milk. Whales are worm-blooded and keep their bodies warm owing to tick layer of blubber- fat under the skin, covering almost entire body[2].

Baleen whales (*suborder Mysticeti*) differ from toothed whales (*suborder Odontoceti*[3]) in numbers of characteristics. The dentition of baleen whales represents rows of baleen plates or whalebones, made of keratin, which makes possible their filter feeding. By filtering seawater through their baleens, they absorb the small organisms (krill or plankton) retained between these plated. Toothed whales, on the other hand, have teeth and feed mainly with fish and squid which they hunt with the help of echolocation (biosonar). For species' characteristics, population size, conservation status and range of habitation see Table 1 in Appendix I.

[1] Lawrence.(2002) Cetacea, Overview; *Encyclopedia of Marine Mammals* San Diego, Calif., London Academic, p. 204
[2] http://www.whale-info.com/
[3] Subject of this study are only family Physeteridae , while sub-order Odontoceti includes also the families Kogiidae, Delphinidae, Monodontidae, Phocoenidae, Iniidae, Lipotidae, Pontoporiidae, Plataniztidae and Ziphidae (see Rice, Dale W. 1998)

Figure 1. Taxonomy of cetacean species subject to analysis of this master thesis



Source: elaborated on http://www.discover-whales.com/whale-species.html

2. Short history of commercial whaling

For the importance of whales as food source and means of livelihood implies the fact that bones from cetaceans were revealed in archaeological site near Ulsan, South Korea dating from 6,000 BC[4]. MacLean et al. (2002) report that the hunting of great whales was developed in distant parts of the Globe in different points in time. One of the earliest cultures known to exercise whaling is the Maritime Archaic in the region of Labrador and Newfoundland, around 3000 B.C. The Inuit tribes in northern Alaska had completely developed whaling around 800 A.D. and spread quickly across Canada and Greenland. The typical for these cultures was that whales' meat was a main component of their food diet and therefore hunting of marine mammals was crucial factor for their survival.

The beginning of commercial whaling and its departure from the subsistence purposes is associated with the Basques, living in 11th century[5]. As Ellis (2002) states, they were the first European people hunting whales in an organized, industrial manner. Basque

[4] "Rock art hints at whaling origins", BBC News, 20 April, 2004; http://news.bbc.co.uk/2/hi/science/nature/3638853.stm
[5] Ellis(1991), *Men & Whales*. Alfred A. Knopf, p.45

began using watchtowers (vigias) erected on the shore, from which they could spot the sprouts released from the whales. Along with the development of knowledge, technology, industries and trade, new application were found for whales. The blubber of the whales was processed and the derived from it oil was used for the manufacture of candles, soap, cosmetics, wool, leather wax and paint, the baleens for decoration and the rips as fence pickets. The discovery of Spitsbergen islands (today part of Svalbard archipelago, Norway) in 16th century set the beginning of fierce rivalry between Dutch, French and British whalers, forcing out the Basques from the industry. This unregulated access to the whale stock led to the near extinction of sperm and bowhead whales in that region. Sperm whale was hunted for spermaceti- liquid in the front head of the animal, which when exposed to air solidify. The oil derived from this wax was highly prized for its quality. Candles made of this oil were considered luxurious because they were odorless and did not emit a black smoke, in contrast to the candles produced from baleen whales. The baleens were used for corsets and umbrellas, skirt hoops and number of other necessities while the meat was given to the poor (Ellis, 2002, p.1312-1314).

Commercial whaling with organized regular **pelagic** fleets (see explanation notes in Appendix I) emerged in 17th century and until 19th century it developed in a complex industry. The method of hunting with small open boats and hand-thrown harpoons used largely in past centuries changed radically with the invention of explosive harpoon and steam vessels in 1860[6]. This opened new opportunities for whalers. The faster swimming species, such as blue, fin, sei (*B. borealis*) and Bryde's whales (*B. brydei/edeni*) which were elusive for the hunters so far now were under target. As Claphman and Baker (2002) point, catching capacity was initially constrained from the fact that the carcasses have to be processed (**flensing**) on onshore in land stations. This limitation was overcome with the introduction of **factory ships** in 1925. Owing to these vessels whalers were able to sail remote distances, discard the carcass onboard and stored it in casks (barrels). With the increased demand for **whale oil**, catches far exceeded the carrying capacity of whale stocks. The introduction of new technologies which facilitated the catching and processing of whales had as a consequence fast depletion of cetacean species. When first the North Pacific right whale (E. japonica) was taken in 1835, 14 year later the population was commercially exhausted. Between

[6] Clapham and Baker (2002) Encyclopedia of marine mammals, p. 1328-1332

1904 and 2000 total harvest of great whales amounted 2,039,621[7](for the total number of whales taken by selected countries and species see Figures 1 and 2, Appendix I). The massive destruction of whale stock called for instant intervention on an international level. This led to the worldwide protection of right whale in 1935 and grey whale in 1937and the signature of the International Convention for Regulation of Whaling (ICRW) in 1937. In 1946 the International Whaling Commission was established as an organization to regulate whale catch and manage conservation of whales[8].

Yankee (USA) began hunting of great whales in middle 17th century,. The towns of Massachusetts, Long Island and Nantucket were the host of fleets and centers of whaling industry (Starbuck, 1878). By 1732 the Yankee reached Davis Strait, between Greenland and Baffin Island and since then a huge expansion to Africa, Azores, Falklands and coastal South America has begun. Until 1846 the whaling industry was booming with whale-ship fleets numbering 736 vessels (Tower, 1907). Whales' oil was used for candles and lamps for lighting of houses and streets as well as lubricant. With the discovery of kerosene in mid. 19s (which had superior lighting qualities than blubber) and the invention of substitutes for whale blubber and baleen, commercial whaling started to decline. By 1895 the Yankee whaling fleet had reduced to 51 vessels and only four ports regularly sent out ships[9]. According to Mawar (1999) the last whaling port- New Bedford abandoned whale hunts in 1927.

Although it is not certain when Japanese whaling began Kasuya (2002) reports that whale were hunted for subsistence purposes from Okhotsk Sea culture of Hokkaido Island in the 5-14th centuries. Skeletons of cetaceans, primitive harpoons and cave drawings of whales were found in that region, suggesting for the hunting activities these people had exercised. The same author states that one of the first records of organized whale hunting with harpoons dates from the 1570s in Morosaki cove, close to Ise Bay. Japanese used the meat for food; the whale oil for soap, lamps and mixed with vinegar for rice paddies; the bones for fertilizers and the baleens for fans, fishing rods, lantern handles and many others[10]. Till the end of 19th century commercial whaling was fully developed. Juro Oka established Nihon Enyo Gyogyo K.K.- the first modern whaling

[7] Yablokov et. al.,(1998)
[8] International Convention for the Regulation of Whaling, with Schedule of Whaling Regulations, 2 December 1946, 62 Stat. 1716, 161 UNTS 72.
[9] Tower, W.S. (1907), A History of the American Whale Fishery, University of Philadelphia, p 64
[10] Ellis, R. (2002) Encyclopedia of marine mammals, p. 1316-1327

company in Japan and introduced the Norwegian-type of whaling (using power-driven vessels, cannons and exploding harpoons) in 1899 to Japan. From 1909 Japan placed whales hunting under government control, constantly reduced the number of catchers' boats and imposed quotas on the number of species caught each year. The country continued commercial hunt of whales until International Whaling Commission (IWC) declared protected blue whale in 1965, humpback (1966), fin and sei whales (1976).

Whaling has been part of the Norwegian economy and culinary traditions for centuries. At the beginning the whale hunt was implemented from onshore where the numerous fjords, bays and islands along the Norwegian coastline served as breeding ground for the migrating species (Marshall, 2000). By 1912, Norway dominated the majority of the world's whaling industry[11]. In 1925 the country introduced the factory ship which increased dramatically its catching efficiency. This improvement allowed fishermen to expand their whale takes from 12,000 in 1910 to over 26,000 in 1931(see Figure 1, Appendix I). During the World Wars the whaling activities were temporary ceased, to resume again in 1946. However, in mid. 20th century the massive depletion of whales became evident and Norwegian, as other whaling nations' catch started to diminish.

Despite attracting the international attention with its resumed whaling industry, Iceland has never been hegemony in commercial whaling. The beginning of commercial whaling in the country is associated with the establishment of the first shore station at Seydisfjordur in 1865. However, compared with other whaling nations the amount of species taken by Iceland is rather modest (see Figure 1, Appendix I).

3. International regulation of whaling and trade- IWC and CITES

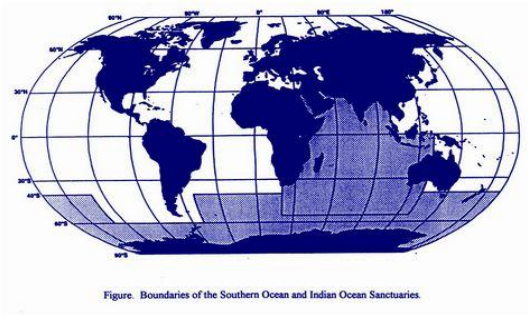
An attempt to regulate the unrestrained whale hunting was made in 1930 when quotas for annual catch were introduced in the face of blue whale unit (BWU). Blue whale unit was a measure for the total yield of whale oil where one blue whale unit was equal to one blue whale, two fin whales, two and a half humpback whales and six sei whales. Whalers could catch any of these species to complete the quota, irrespective of the conservation status of different species. In 1950s the Antarctic quota for pelagic whaling was set between 14,500 and 16,000BWU for all whaling nations which set them in a race to catch as many whales as possible until the quota was filled. This kind of quota, which did not take into consideration population size and reproduction rate of

[11] www.internationalbusiness.wikia.com/Norway_History_of_Whaling

the species later appeared to have devastating consequences on whales stocks. The BWU quotas remained in effect until 1972 (Barlow, 2002). Recognizing the failure of BWU quota IWC replaced it with New Management Procedure (NMP) which distinguished between initial, sustained and protection stock (Oberthür, 1999). Even though this approach automatically led to the exclusion of some species from commercial whaling, the IWC inability to set optimal catch limits for non-protected species remained. This forced IWC to take radical measures and declare "pause" or moratorium on commercial whaling in 1982 (starting from 1986), which is still in force today. Also, IWC created the Indian and Southern Ocean Whale Sanctuary, 50 mill. squared kilometers surrounding Antarctica (Figure 2). Currently the member-countries of IWC are 88 where only few of them have interests in whaling.

Initially the aim of the Convention from 1937 was to "provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry". Since the commission was set on a voluntary principle, each country has the right, in a case of disagreement with any decisions, to leave the commission and rejoin afterward. Any government could object a decision made by the organization. This loophole was used by the Norway (1993) and Iceland (2006) to object the moratorium and resume commercial exploitation of the whales' resources. Over the years, the International Whaling Commission has been transformed from a "whaling club" to a "preservation club" (Sigvaldsson 1996).

Fig 2: Indian and Southern Ocean Whales Sanctuaries ***Source: IWC***



The founding of the IWC was induced by the need of regulation the whaling industry and place control on the overexploitation of the whale stock on an international level. The economic reasons behind the initiatives were the need to maintain the whales stock on a level feasible for industrial exploitation and prevent the oversupply of whale products. Due to the fact that single government has no authority over whales as natural resources, its unilateral conservation policies will hardly be effective. Self-restriction as an attempt to sacrifice short-term profit for future return will have no the aimed effect but to benefit the competitors instead.

PART I

IWC recognizes the following types of management of whales as natural resources:

Commercial whaling- this is whale catch implemented on a profit-making base, which abides by the market principles of supply and demand. The goal of IWC is to develop safe catch limits embodies in the Revised Management Scheme (RMS), considering the mistakes made with the BWU quota and the limitations of data about the abundance and caring capacity of the animals. Despite the considerable pressure from some whaling countries to put in force the RMP and remove the moratorium for certain stocks of whales the Commission would not lift the ban until other non-scientific factors are clarified. These include inspection and observation scheme which discovers malpractices of falsification of catch data and mechanism to ensure the catch quotas are not exceeded.

Scientific whaling- the option to take whale for scientific research was set in Convention in a time when lethal method was the only way to examine the species. Today it is highly criticized by the non-whaling countries and non-profit organizations as a tool used from catching nations to circumvent the ban on commercial whaling. Since 1982 more than 100 permits have been issued from different countries, including Japan, Norway, Iceland, Canada, United States, USSR (today Russian Federation) and South Africa (Donovan, 2002).

Aboriginal (subsistence) whaling- it is performed for subsistence purposed from small aboriginal communities on non-industrial basis. The reason the Commission to permit this kind of whaling is that it is on small size, in most of the cases it is a main source of food and it takes into account the cultural values and whaling traditions of the community. There are differences between commercial and aboriginal whaling which IWC has to consider in the management of both types. Commercial whaling is carried out with the means of factory ships and catchers boat. The products derived from the animals are processed in factories with highly sophisticated technologies and the final product is designed for the domestic commodity market or export. On the other hand, aboriginal whaling is in much smaller size, the hunt is implemented with small ships or boats from local people. The final yield is meat or derivatives processed with a simple technique. The final products go for personal/individual consumption. The total number of catches taken under scientific permit can be seen in Table 2, Appendix I.

Small-type whaling- in the Schedule of IWC, which is an integral part of the Convention, it is written that "small-type whaling means catching operations using powered vessels with mounted harpoon guns hunting exclusively for minke, bottlenose, beaked, pilot or killer whales". It is considered as something in-between commercial and aboriginal whaling as it is performed from small coastal communities but it is not for subsistence uses (food) but rather as an employment alternative in the local region.

Illegal, unregulated and unreported fishing/whaling (IUU)-take place where vessels operate in violation of laws of coastal state or international agreements applicable to **high seas**. It leads not only to economic losses but also to underestimation of the real size of whales stock and distortion in the ecosystem balance.

The Convention on International Trade in Endangered Species (CITES)

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) came into force in 1973 as a result of a resolution adopted by countries-parties to International Union for Conservation of Nature (IUCN). The aim of the agreement is "to ensure that international trade in specimens of wild animals and plants does not threaten their survival" (CITES, Article VIII, paragraph 3). Approximately 5,000 animals' species and 28,000 species of plants are protected under CITES against overexploitation through international trade. Each species is included of one of the three lists- Appendix I, II and III, according to the degree of hazard it faces and the corresponding controls that apply to trade. Trade with wild caught species listed in Appendix I is forbidden (exceptional permit is granted only in licensed circumstances). Species listed in Appendix II and III are not necessary threatened with extinction and trade is allowed under strict control measures. Despite the fact that all "great whales' are listed in Appendix I, the three national currently engaged in whaling- Japan, Iceland and Norway- hold reservation to several of them, thus enabling the countries to trade with whale products between themselves, or with non-parties to CITES (Tinch and Phang, 2009). Trade with specimens listed in one of the three lists is subject to strict conditions: "a specimen of a CITES-listed species may be imported into or exported (or re-exported) from a State party to the Convention only if the appropriate document has been obtained and presented for clearance at the port of entry or exit". A standard procedure includes import (export or re-export) permit and a certificate of origin. The grant of such permit is possible only when certain conditions are met, complexity of which vary for every appendix.

PART I

4. Utilization of whales as resources

What are the key features peculiar for cetaceans as natural resources and which distinguish them from other types of traded goods? First of all, they are both scarce and useful (have **economical value**) in production or consumption, either living, in their raw state or after minimal amount of processing (WTR, 2010). Second, they are renewable: as living organisms they have the ability to reproduce, thus even if part of the stock is removed the remaining part will replenish, providing an opportunity for sustainable harvest. However, if **overharvested** (see explanation notes, Appendix I) they can turn into exhaustible resource. Third, the postulation that natural resources are unevenly distributed across countries still hold with the exception that whales are highly migratory species and they do not reside permanently in any country' territorial waters. Additionally, the production (harvest) and consumption of given resource involves externalities. As part of the fishing sector whales face common threats of by-catch, pollution and predator-prey-tie destruction. Their harvest can impose negative externality on other industries (whale-watching tourism) too.

Dr. Rob Tinch and Zara Phang (2009) categorize **the values** derived from the utilization of whales in direct, indirect and non-use values.

Direct use can be **consumptive** use where different part of the animal are used for food, pharmaceutical, agricultural fertilizers and cosmetics, and **non-consumptive**. Non-consumptive means use of alive whales in their natural habitat for recreation (whale-watching), cultural and scientific activities (scientific research programs[12], TV shows, documentaries, advertisement etc.).

Food- While not so popular nowadays, the whale meat is consumed in some parts of the world. Presently, it is eaten in Iceland, Norway, Japan, Inuit groups[13] in North America and Russian Federation (MacLean et al. 2002) and some island communities (such as Faroe Islands[14], Caribbean island of Bequia, islands of Philippines and Indonesia[15]). Although whale meat is a product from the sea, it does not resemble the taste of fish. It is rather seminal to "a high quality beefsteak". However, it is a quite fragile good that spoils quickly and has unpleasant "fishy" smell and taste if not stored properly (TRAFFIC, 2001). The value of whale meat is seriously undermined from the fact that

[12] scientific research may be also consumptive use if the whales are killed
[13] The Inuit are indigenous peoples inhabiting the Arctic regions of North America (Canada's Northwest Territories, Nunatsiavut, Nunavik, Nunavut), Alaska (United States), Greenland (Denmark), and Siberia (Russia)
[14] http://www.whaling.fo/
[15] Ellis, R. (2002) Encyclopedia of marine mammals, p. 1315

it contains high levels of pollutants such as mercury (Hg), chromium (Cr), PBCs and dioxins (Tinch and Phang, 2009; Wise at al., 2009). Some of them are well-known carcinogens and the meat containing these elements should not be eaten.

Japan is one of the main users of whale meat for human consumption. It used to have more than 70 cuts from the whale in the past, while today only the belly meat and flukes are used for food (Palmer, 2010). Traditionally, whale meat is consumed in coastal communities and as an ingredient of some traditional dishes (sashimi is a famous dish prepared from slices of various raw fish, including whale meat[16], served in specialized Japanese restaurants all over the world). The massive consumption of whale meat in Japan is associated with the period after World War II (see Figure 1, Appendix I). For the impoverished population it was the only source for animal proteins (Misaki, 1993). According to Endo and Yamao (2007) annual supply of whale products before the moratorium has been estimated of approx. 14,500 tons annually, while after 1986 the total market contracted to 6,000 tons per year. Estimated whale meat consumption is falling each year- about 5,000 tons in 1990 to 3,500 tons in 1998 (Ishihara and Yoshii, 2000). Though the decline of whaling industry, Japanese government subsidizes the market through distribution of meat in schools (school lunch programs) and other promotion (such as development of new products- whale ice cream, whale burgers; chef competitions (Tinch and Phang, 2009).

Norway also conducts promotion policy for consumption of whale meat. The whaling industry is subsidized, accounting to up to 50% of the gross value of the whale meat landed thought Råfisklaget[17] in the period between 1994 and 2008 (Tinch and Phang, 2009). The annual consumption of whale meat was only 0,25 kg per capita in 2000 despite the efforts to modernize the old-fashioned image of the product and attract new customers (Ostli, J. 1999). In 2005, Karsten Ellingsen Company made an attempt to launch new product- "Lofotburger", based on half mink whale half pork meat, aiming at new generation buyer, but it did not achieved much success and sales were ceased in 2008[18].

Iceland total meat market was estimated to be close to 22,000 tons in 2003, hardly 15 tons of which was whale meat. Having in mind that that country has population of

[16] Bestor, C. T. (2004) Tsukiji: the fish market at the center of the world, *University of California Press*, p.347
[17] Norges Råfisklaget –the Norwegian Fishermen's Sales Organization, which lands and sells about 80% of the whale meat in Norway
[18] Trapper ned hvalkjøp. FiskeribladetFiskaren. 13.03.2008. “The whaling industry is in a downward spiral,” said Ulf Ellingsen, chairman of the company. and Ingen vil ha hvalkjøtt, NRK. 02.04.2008

317,600 people in 2010[19], it is evident that the market growth of whale products is rater limited.

Pharmaceutical use- Russia, Norway and Japan have conducted a number of studies on the medical uses of whale products. Whale oil is reach in Omega 3s acid, which make it applicable in treatment of inflammation associated with Rheumatoid Arthritis" (RA) [20]. Norwegian researchers investigate the effects of whale oil on different common deceases such as rheumatoid arthritis, Crohn's disease, psoriatic arthritis, diabetes etc. and some of the investigations now reached clinical trial phase (Bjørkkjær, T. et al. 2009). Japan has examined the application Chondroitin 4 sulfate and Proteoglycan (PG), extracted from whale cartilage. Different Japanese companies hold patents for a number of pharmaceutical products based on whale cartilage.

Animal Feed and Fertilizers - Whale meat and oil are used for the feed of domestic livestock and industrial fishery. Iceland has the infrastructure and capacity to manufacture animal feed from whales and its ambition is to develop worldwide market for its production. In the beginning of 2010 a controversy arose from the fact that in 2009 Iceland made two shipments of total 23 tons whale parts used as agricultural fertilizers to Denmark[21]. This is considered to be in violation of CITES and EU law. Norway is a leading manufacturer and exporter of fish oil from farmed fish and its easy access to whales would allow the country to develop animal feed based on whale oil.

Cosmetics- The wax derived from the spermaceti oil of sperm whale can be found in different cosmetic product. Spermaceti make brilliant white crystals that are hard when touched but oily at the same time, and have no taste or smell. This makes it a useful component in fabrication of lipsticks, body creams, gels, different lubricants etc. In skincare it is highly appreciated for its similarity with natural wax esters found in human skin sebum. Because of the ban on hunting and trade with sperm whale it is rarely used in the beauty industry today.

Today all products derived from whales can be synthetically produced or other products can be used as their substitutes. Table 3 in Appendix I presents a number of products produced by whale and their contemporary substitutes.

[19] Statistics of Iceland, http://www.statice.is/statistics/population
[20] Reinventing the whale (2010) A report by the Whale and Dolphin Conservation Society (WDCS)
[21] Statistics Iceland- the centre for official statistics in Iceland, http://www.statice.is/

Whale-watching- Watching of whales in their natural habitat for recreation purposes becomes new activity and growing business in 21st century. According to Hoyt (2001) in 1991 4 million people went whale-watching in 31 countries. The total expenditure[22] amounted of USD 317.9 million at than year. Almost 20 year later, in 2008 a study from the International Fund for Animal Welfare (IFAW) reports that almost 13 million people took whale watching trips in 119 countries, generating total expenditure of USD 2.1 billion (see Figure 3, Appendix I). For the rapid expansion of the whale-watching tourism speaks the fact that in the period of 1988-1991 the average annual growth rate at a global level was 39.2%, albeit the trend slowed down to 3.7% in last decade ((O'Connor *et all.*, 2009). Many of the nations which used to hunt whales in commercially in the past now successfully develop whale-watching tourism. With around 5 million tourists which took cetacean-watching trips every year, United States ranks as the country with the largest whale-watching industry in the world.

What were the factors which led the countries to make the transition from catching to watching? As was explained above the combination of global depletion of whales stock, the subsequent moratorium on commercial whaling and the invention of substitutes to whale oil were some of the reasons for the diminishing of the whaling industry. Kuo et al. (2010) investigate what will be the impact of possible resumption of commercial whaling on global whale-watching industry. They found that the increase in the catch of minke whales has a statistically significant impact on the demand for whale-watching tourist trips. The study shows that the catch of one minke whale will reduce whale-watching demand by about 0.28–0.33 visitors. The authors highlight that a possible end of the international whaling moratorium would have stronger negative effect for actively whaling countries because of customer boycott to their tourism and tourist-related industries. Despite the fact that whaling is regarded as an activity incompatible with whale watching, number of cases in Japan, Iceland and Norway prove that coexistence of both industries is do possible (see Part III). Moreover, different studies recognize ecotourism (Agardy, 1993; Weaver, 1995), and in particular whale-watching tourism (Moyle and Evans, 2008), as a link between regional development and resource conservation.

[22] Total expenditure in whale-watching tourism comprises direct expenditure (spending on trip tickets) and indirect expenditure (all associated spending, including travel cost, hotel, souvenirs, equipment etc.)

Indirect use- this use is associated with the role of whales in ecosystems. In the study called "Whale-Watching and Herring Fishing: Joint or Independent Production" Min-Yang Lee (2008) investigate what is the effect of "localized depletion" of herring in the Gulf of Maine, USA on a "non-extractive marine activity" such as whale-watching tourism. He concludes that the depletion of herring stock in the area might have negative impact on the whale-watching tourism because, as a source of food for whales, the absence of this fish means that the whales will leave the region thus increasing the efforts (costs) for whale-watching operators. Another example is the predation impact which whales have on commercially valuable fish. It is argued that because whales eat too much fish they reduce the amount available for fishermen therefore their population should be controlled (see "Whales-eat-fish" debate, explained in Part III).

Non-use values- These values are closely related with the cultural heritage and traditions in one society. Here emerges the difference in perception of whales in different cultures. For ones **altruistic value** (the knowledge that contemporary generation can enjoy whales) and **bequest value** (the knowledge that future generation can benefit from whales) is the pleasure of whales' beauty while for others it is the delight of whale meat. Other non-use value is **existence value**- what value people place on the knowledge that whales will continue to exist, beyond any use made of them now or in the future.

Conclusion Part I

Different socio-economic forces have led to the decline in whaling on global scale and the raise of new non-consumptive use of the marine living resource. Two tendencies dictate this transformation. From one site the massive exhaustion of the world whales stock after decades of commercial exploitation and the consequent discovery of whale oil substitute have led to the decline in the demand for whales as consumptive resource. From the other side, after the period of world wars and temporary cease on whaling, new movement for social awareness, conservation and non-consumptive use of marine living resources arouse.

PART II INTERNATIONAL TRADE THEORY AND WHALES

While the previous part gave details how different countries activities have led to the massive reduction in the whales stock, this part seeks to explain the economic forces which caused this depletion. It presents the international trade theory which clarifies why some countries specialized in whale hunting while other not, and how market imperfections have led to the overfishing of the whales stock. Why there was total ban on whaling and trade with whale product? Does the foundation of the International Whaling Commission correct any externality of the market? Does trade exacerbate environmental degradation and what policies can be adopted in order to preserve the natural habitat? All these questions are addressed below.

Comparative advantage and factor abundance – Hecksher- Ohlin proposition

The development of thriving whaling industry from Basques and later Dutch, British and American societies was not accidental. Trade theory suggests that different factor endowments prompt countries to specialize in the manufacture of those products which use the relatively abundant factor of production. According Heckscher- Ohlin proposition the relative abundance of one factor in a country leads to its lower price and therefore lower price of the products which intensively use that factor. The explanation is that, in a neoclassical framework[23], a country will specialize in the manufacture and export of the product which require the intensive use of relatively abundant (therefore cheap) factor of production and import that product which use intensively the countries' relatively scarce (therefore expensive) factor of production. Different factor endowments form a source for comparative advantage in international trade where two countries can specialize in and exchange products which they produce more efficiently. The net benefit of such exchange is **gain from trade**[24] and increased welfare (compared to autarky) in both counties (Marrewijk, 2006). As natural resources are distributed unevenly around the Globe, this implies that different countries will be endowed

[23] A neoclassical framework uses for the analysis two factors of production, two final goods and two countries with homothetic preferences for the same goods. Also, there are no externalities of the market, the firms produce under perfect competition and constant return to scale.
[24] Gain from trade is a concept in international economics which refers to improved **terms-of-trade** (TOT) for two countries under free trade. TOT is the price of exports relative to the price of imports- it is a proxy for social welfare used in international theory (see Marrewjik, 2006).

unequally with different factor of productions. Whales as natural resource make no exception.

At the beginning of industrial whaling, whales were abundant in the waters close to the coast, which was in easy reach for whalers. As explained in Part I, at first whaling was implemented close to shore due to facility constraints of sailing vessel and processing technology. Therefore only nations which had abundant stock in their adjacent waters could develop whaling. The historical record shows that Basques, which inhabited the coasts of French and Spanish Bay of Biscay, were the first Europeans to establish organized and large-scale whaling. Later Dutch, British, Norwegian and American fleets expanded their whaling voyages to Spitsbergen (Svalbard archipelago of Norway), the waters between the island of Newfoundland and the Labrador coast, and Greenland Sea which were feeding and breeding fields of Grey and Bowhead Whales. The easy reach to waters abundant with whales, made these nations naturally endowed with renewable resources, which they utilized for the purpose of lighting and lubrication. An evidence for the well developed whaling industry in these coastal countries is the fact that in 1912 Norway exported 34 per cent of her whale oil production to Germany (Tønnessen and Johnsen, 1982). The fat was used for margarine and, in war times, the glycerin in whale oil for the production of explosives. Under the assumptions made by the neoclassical trade theory, the prediction that under free trade all coastal countries with access to whales stock will develop whaling industry holds true. When imperfect competition is introduced in the model, the standard Heckcher-Ohlin assumptions continue to hold, with the only exception that monopolists will maximize profit setting marginal revenue below the demand curve, thus selecting more conservative extraction path which will preserve the resource (Bergstrom, 1982). However, the static Heckscher-Ohlin model does not take into consideration the exhaustibility and inter-temporal trade-offs inherent for the natural resources. The model assumes that the resources will be always abundant and the harvest level today does not impact the harvesting rate and consumption of the recourse tomorrow. Understanding the complexity of whales as natural resource means including features in the model, which are specific for the natural resources. Such features include exhaustibility, common pool problem and environmental externalities related to the process of extraction (harvest). The study continues with explanation of trade between countries suffering of open access problem.

PART II

Exhaustibility, open access and environmental externalities

In the economic theory whales are considered renewable resources because they can be used for infinite period of time if the harvest rate matches the rate of reproduction. However, although whales, as every animal on that Planet, have the ability to reproduce and grow in population size, they could be brought to extinction by overexploitation. Therefore, the problems inherent for finite resources are also relevant for renewable resources prone to overuse. In addition, there is another negative effect connected to the use of natural resources- the environmental externalities. This comes from the fact that the process of extraction of a given resource may affect a party which is not directly involved in this process. An example of such externality is killing whales as a by-product of catching fish. Because the market price of the fish does not take into account the negative impact on whales' population the full cost of fish harvest are not born by the fish producer. For the purpose of this study explicit attention will be turned to the overexploitation of renewable resources. What are the reasons for this external effect and what policies can be undertaken as remedies of the problem.

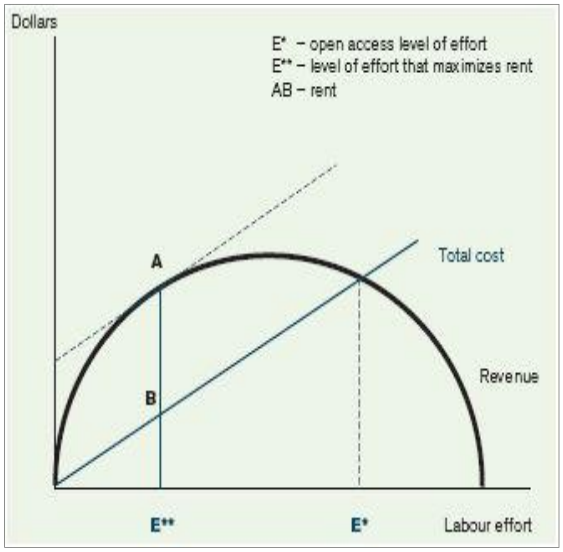
As migratory species, which inhabit the whole Global Ocean, whales do not belong to any country's adjacent water territory. Hence, the fact that no country can claim rights of ownership on the animals raises the problem of open access to the resources, which has been investigated for fist time by Garrett Hardin (1968). He wrote that "**the tragedy of the common"** phenomenon emerges in situations where group of individuals share common pool of (or open access to) a given resource. Acting solely in their self-interest they will try to extract maximum benefit from the common thus reducing the others' welfare and eventually depleting the limited resource. "An open access resource is one lacking property rights, so all producers can use the resource [freely]", unable to fully internalize the cost of stock depletion (Brander and Taylor, 1998). The primary consequence of current stock depletion is that harvesting becomes more costly in the future.

This externality is quite relevant in fisheries as well as whaling industry. The relationship between the profits derived by every whaler and the welfare of the rest of the participants is negative- when one whaler increases his yield it will reduce the number of whales available for the rests thus diminishing availability of the common resource. The result of too much entry is that too much whaling efforts are put in order

to catch one whale, thus the costs exceed the total yield. The consequences of this uncontrolled access are that too much entry leads to dissipation of the rent[25] between all the agents (World Trade Report, 2010). Because there is no mechanism which makes possible for a whaling nation to fully benefit from her conservation efforts, no country will reduce its whaling effort for the sake of the common. Consequently, open access harvesting leads to full profit dissipation and extinction of whales stock.

Optimal resource extraction path- The future growth of the renewable resource "depends positively on the size of the current stock". The argument is that sustainable harvest, without leading to depletion, is possible when only the growth amount in each period is harvested and the rest of the stock is left to replenish. The relation between open access and optimal harvest of natural resource, applied to the whales' issue is given in Figure 3. As the harvested quantity depends on the total size of the natural stock and the amount of labor employed, initially the increase in the efforts means increase of the total catch. However, continuous increase the input effort leads to eventual decline in the cetacean stock because the carrying capacity of animals cannot maintain the level of exploitation. This is shown by the downward slopping Revenue curve in the figure. The more whaling efforts are employed, the smaller the equilibrium stock, the smaller the net yield derived (as costs exceed the profits). The interaction between the Total cost curve and the Revenue curve in the figure shows this correlation. With open access regime, the more entrant will try to capture diminishing amount of whales till the moment where the last unit of whaling effort exceeds the remaining rent at point E*. Because it is not possible to exclude others from harvesting the common pool resource, with more entry the rent goes to zero and finally is fully dissipated. In a hypothetical

Figure. 3 Open access level of effort and optimal harvest of natural



Source: World Trade Report 2010

[25] rent is the economic profit which is earned in excess to the amount required to cover the opportunity costs (associated with employing the funds in the current activity rather that its best alternative) and sustain the current the current level of factor use.

situation with a single owner (the social planner), he has interest in maximizing the rent and would allow entry only to point E** where the slope of the Revenue curve (point A) equals the slope of the Total cost (point B) (i.e. the marginal revenue equals marginal cost). Thus, the resources will be harvested only to a level which allows both healthy sustenance of the whales population and maximized social welfare. This is in case the owner does not discount the future. If he discounts the future with a rate going to infinity, the owner will harvest everything today because he attaches zero value to the future revenue.

How the social planner can restrict entry and maximize the social welfare? Having the ability to restrict others from the open-access recourse means strong property rights and institutions in place to secure these rights. Alston et al. (2009) describe the property rights as a privilege to use the asset in a way which suits your interests the best and does not interfere with the property rights of the others; the ability to derive profit, sell, bequeath and exclude others from using the asset. Single private or governmental ownership may solve the problem. Whereas the first seeks to maximize to the rent with zero discount rate, the later could have other objective for restricting the entry- for example preservation of biodiversity by optimal harvest of the species. The concept of the property rights is consistent with both the economic interests of rationing the access to stock thus increasing the rent and the environmental goals of preserving the biodiversity.

How the nations solve the problem with open access to fisheries and in particularly whales? As Part I tells, at the beginning of commercial whaling there was no control over hunting. Later, when stock started to decrease and the whaling countries have fully developed their catching industries, the rationing to harvest though blue whale unit quotas was introduced. However, as the cetacean population continues to decrease, the countries felt the need to assign a single international body which can regulate and control the take of the resource. The foundation of the International Whaling Commission sought to address the problem with property rights over whales on international level.

In order to ensure that the member countries will comply with its regulations there has to be a mechanism in place to observe and control the individual countries behavior. The theory suggests that the strength of the property rights over natural resources

depends on the ability of the regulator to **monitor and enforce** the rules for access and harvesting. The Revised Management Scheme (RMS) of the IWC is a thought to be such a tool for surveillance over the catch quotas (see Part I). However, it is still not estimated the safe limit which will allow sustainable renewal of whales stock. Investigating the market of whale products in Japan, Baker et al. (2008) proves that monitoring of the whale-meat market and detection of illegal, unreported and unregulated (IUU) catch is possible with a public register containing DNA samples from all the species entering trade. Such registers do exist in some of the currently whaling countries but they are not publicly available therefore it is impossible to track the source of origin for a given whale product.

Trade and open access harvesting

Brander and Taylor (1997) investigate what is the effect of trade opening on countries with strong and weak property regimes. In a two country model, holding the amount of natural recourses, technology and customer tastes equal, they find that different strength in property rights creates a basis for comparative advantage in trade. The state with weaker property rights will harvest larger quantity in the present moment than a country with stronger property rights. When trade is allowed, the first country will export to the second thus depleting its resources (see Difference in the demand below). Emami and Johnston (2000), on the other hand, explain that if the demand for the resource is high, the nation with insufficient property protection may end up importing resources. This is because with high demand this country will rapidly deplete its stock and will have to import from the country with strong property rights. Therefore where the poorly defined property rights exists, the opening for **free trade** leads for exacerbation of natural stock exploitation and the overall welfare is lower than in autarky. When demand is endogenous, Copeland and Taylor (2009) prove that the opening to trade may have positive effect on the country with weak property rights. In such cases the ability of the government to protect the property rights will be affected by the relative price and the trade opening. The higher price could trigger an incentive to extract more in the present moment but if the regulatory institutions are sound and the penalty for overexploitation means lose of access to the resource, the final outcome from free trade might be positive. When both trading partners have effective property rights regulations they will be able to resist the pressure of trade opening and rip the benefits as standard economic theory predicts.

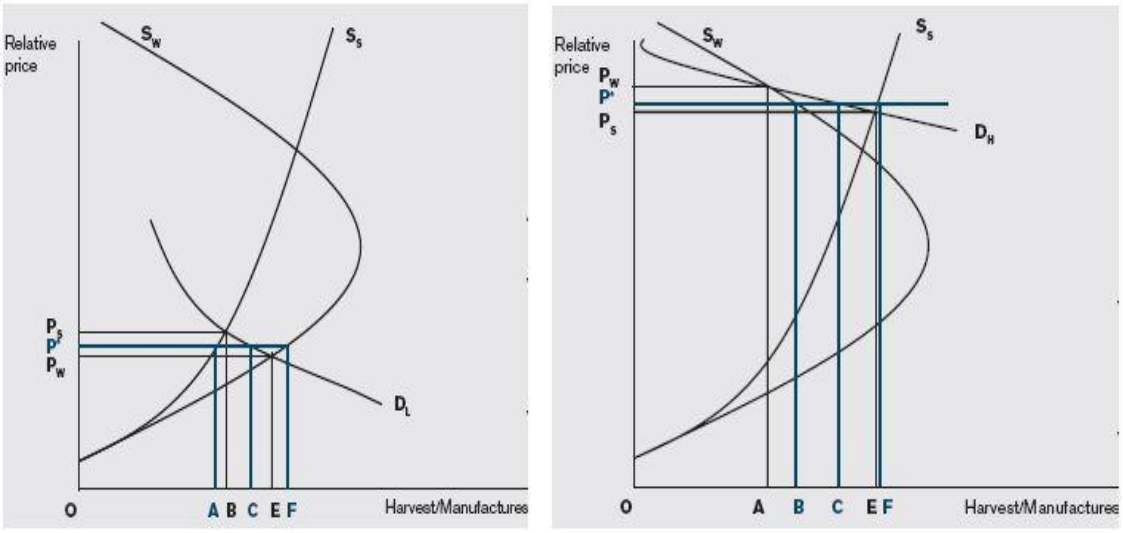
PART II

Introducing other factors in the model- So far the renewable resources with open access problem were studied is the basic neoclassical framework of the model. There are number of **other factors** which influence the extraction path of these resources, which impact may change the predicted results.

Difference in the demand- The theory revised above predicts that "gains from trade" derived under Hecksher- Ohlin postulation is undermined when natural resource sector suffers from open access problem. However, when introducing different level of demand in the model the prediction changes. Figure 4.A represents a situation of free trade between a country with strong property rights and a country with poor property rights which have relative low demand for the resource. The supply curve of the country with weak property rights is backward bending due to the fact that when the price of the resource increases the amount of harvest declines. The reason for the negative correlation between price and supply is the following. When the price of the natural resource rises, more labor is attracted to the sector. The increased efforts reduce the amount of natural resource and lower the labor productivity (when additional whalers try to catch as much as possible whales, from which total population start to diminish until the moment where total whaling efforts exceed the profit derived from the total catch). The decline in stock leads to increase in price, but the higher price cannot compensate for the loss in the productivity and consequently the supply shrinks.

When the demand in both countries is relatively low (D_L in Figure 4.A) and trade is opened up, the world price (P*) will set between both countries' prices (Ps and Pw).

Figure 4.A: Free trade with low demand B: Free trade with high demand



Source: World Trade Report 2010

The country with weak property rights will start to export (CF) to the country with strong property rights thus depleting its stock of resources. As a consequence of the import (AC) the strong property right country will reap the standard gains from trade while the other will suffer welfare loss. However, if the demand is relatively high ($D_{\mathbf{H}}$ in Figure 4.B), the demand curve will settle on the backward sloping supply curve of the weak property right country ($S_{\mathbf{W}}$) causing the addition labor effort devoted to the harvest to lower the natural stock. When trade is opened up with world price (P*) between both countries autarky prices (Ps and Pw), the country with poor property rights will start import in order to meet its demand (BC) from the country with strong property right (CF). Thus as a result from trade, the first country will increase its resource stock and thus attain welfare effect, while the second will reap the standard gains from trade.

Price of natural resources and trade – According to the theory when the price of one commodity increases it will be substituted from relatively cheaper commodity (cite). Compared to most meat products, fish products (including whale meat) have higher income elasticity (OECD, 2010). Therefore when the price of whale products rises the consumption will be redirected to cheaper fish or other meat products (and vice versa)[26]. This is good for the conservation of the species because the falling demand will reduce the extraction level. On the other hand, lower price will triggers the whaling fleets to harvest more in order to compensate for the decrease in revenue.

Chance in technology and natural resources- Standard Heckscher-Ohlin model takes technology as constant over time and therefore change in production/harvesting equipment has no effect on the extraction path of natural resources. The economic literature shows that technologic improvement can have diverse effect on property rights regime and stock of natural resource. On one hand, improvement in harvesting technology can lead to overexploitation and fast depletion of the renewable resource. As already explained in Part I the advance of hunting and processing technologies overcame all constrains faced by the industry. On the other hand, development in monitoring and control technique will lead to better enforcement of access and harvest regulation and thus preserve the endowments from arbitrary abuse.

[26] This is so called "substitution effect" .The final outcome will depends on the "income effect" if we assume that whale meat is a normal good (see Varian, 2006). That is the usual assumption in Hecksher-Ohlin model.

Increase in population income- How does increase in population income (as GDP per capita) affect the rate of whale catch? Classical microeconomic theory predicts that increase in population wealth increases the demand for goods hence rise in the extraction rate in the production factors involved in these goods (again assuming normal good). Schneider and Pearce (2004) give a different explanation for the relation between income and whaling. Since whaling historically exhibits inverted U-shape curve and the increase in wealth is linear, at low levels of income the number of whale caught increases, "satisfying the need for oil and as an input into food". When the income raised, passing a "turning point" on the whaling curve, the global population departed from the use of whales as a basic commodity and began to appreciate the non-consumer values of whales (a factor of enrichment to biodiversity, whale-watching activities etc.). "Preceding the turning point, the linear effect dominates, implying a decline of the resource, whilst after the turning point the quadratic effect outweighs the linear one, stimulating conservation due to the dual nature of the marine resources." This is combined with decrease in whale population and discovery of better substitutes (kerosene, electricity, petrol oil etc.). Therefore they make the assumption that whale-derived products are rather inferior goods (see Varian, 2006).

Positive externalities- so far only negative externalities regarding great whales were considered. There are some positive externalities which also arise from the extraction and consumption of the resources. For example, over-fishing of one species may improve the welfare of other. Conversely, moratorium on hunting of one species may trigger overexploitation of other competitive species (see the case of Japan). Also, the development of one industry may have positive effect on other industries. Such case is the progress of whale-watching industry which contributed of the development of hotels, restaurants and other facilities connected to whale-watching tourism. Information spillover is another example. In the Japanese town of Taiji whalers and whale-watching operators have the practice to share information regarding cetaceans' location, type and size of species. Even though whalers cannot obtain direct profit from what they give, the information they receive in return increase their hunting efficiency. This holds true only when the whale-watching business is not based on a love of cetaceans. If so, then the existence of whalers turns in negative externality for the whale-watchers (see boycott section in Japan and Iceland, Part III).

PART II

From the above stated it becomes clear that the Heckscher- Ohlin assumption about international specialization and gains from trade holds true for the natural resources only when the market does not exhibit externalities. When there is market failure such as open access to the resources and poorly defined property rights, trade may exacerbate the depletion and make the resource- exporting country worse off. The final outcome will depend on other factors- demand, technology, income etc. which, when taken into consideration, may have positive impact on the country's property rights regime.

POLICIES AND MEASURES WITH POSITIVE OR NEGATIVE IMPACT ON WHALES' CONSERVATION

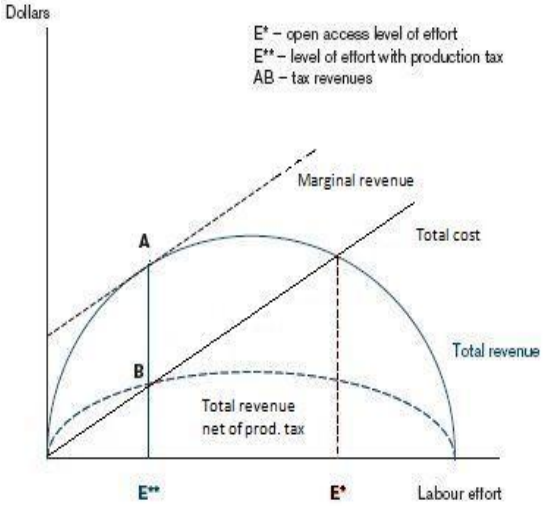
What remedies one country can undertake in order to cope with the problem of open access? The economic literature tells that there are domestic policies and trade measures which could strengthen the property rights and limit the access to the natural resources. However, here is the moment to highlight that domestic policies which directly address property rights represent a first best solution. In this section a short explanation will be given for both, the policies and measures which either correct or exacerbate the open access problem.

DOMESTIC POLICES

Individual fishery quotas (IFQs)- One method for controlling overfishing is the IFQs also knows as Individual Transferable Quotas (ITQs). Accordingly, the total allowable catch of the stock (TAC) is determined by a regulator who calculates the harvested quantities of fish on an annual basis. The sum of all quota shares equals the total permitted amount of catch and each quota could be bought or sold by the agents. If TAC is set too high then it will resemble open access outcome and the quotas will have as a consequence stock depletion. This is what happened in practice with the "blue whale unit" adopted by the whaling countries in 1930s. The quotas were set without knowing the particular conservation statutes of different species thus exacerbating the critical condition of the stocks (see Part I).

Tax on harvest or production- This domestic measure is commonly used by regulators to cut down the rate of extraction of non-renewable natural resources. Based on the logic for the optimal extraction path of natural resource with open access, Figure 5 shows that a production tax may restrict entry and thus lead to optimal harvest of resource. As explainer earlier, the revenue curve goes to zero under free trade (where domestic price is equal to world price) because the attracted additional labor results in total dissipation of the rent (E*). When the regulator imposes a production tax the price of the product raises, but since the exporter is unable to sell the product in the foreign market at a higher price, he will have to internalize the tax by reduced net revenue. Decrease in revenue means shift in labor entry to point E ** where optimal level of efforts is. This leads to maximization of the rent (marginal revenue, equal marginal cost), preservation of the natural stock and transfer of revenue from producers to the government.

Figure. 5 The effect of production (harvest) tax on the resource extraction



Source: World Trade Report 2010

Fishery subsidies (Government Financial Transfers)- subsidy is a form of financial assistance provided by the government to producers (harvesters) for a number of reasons- in order to prevent an industry from decline, secure employment, promote export, reduce costs (fishing efforts) or conserve the fish stock in the case of fishery. The effect of subsidies on natural stock will depends on the current state of the resource. If the extraction rate is currently in the backward-bending part of the supply curve of a country with weak property rights (see Figure 4.A and B) more entry will result in too much labor devoted to the harvesting of too little fish (resource). When the price rises, because of the subsidy, those additional efforts will reduce the stock. If the subsidy is provided in the time when the available stock is the upward sloping part of supply curve, logically it will result in more harvest. Asche and Smith (2009) show what will be effect of a subsidy on international trade if it is provided in the backward-slopping part of the curve. If a country with weak property rights, which imports the open access resource, imposes a subsidy this will lead to more harvest and faster depletion of the

resource. At the new-subsidized price, the importing country will end up importing even more quantities of the resource. Sumaila et al. (2006) distinguish between three types of fisheries subsidies- "bad", "good" and "ugly" .According to the authors "**bad**" subsidies are those which reduce the cost of harvesting (grants for boat fuel and capacity enhancement of fleets). They will worsen the exploitation of open access stock and accelerate its depletion. The reduction of costs raises net rent and attracts more entry until the moment where the rent is fully dissipated (World Trade Report, 2010). The latest estimates show that the World distributes US$ 30-34 billion annually for fisheries subsidies, from which about two-third (US$ 20 billion) are "bad" subsidies (Sumaila et al. 2006). However, there are **"good" subsidies** which contribute to the conservation of renewable natural resource. An example is a **buy-back vessel scheme**, which represents a compensation offered by the government to fishermen who eliminate their fishing vessels. If the subsidy is not used for the purchase of new vessels or enhancing harvesting capacity of the old, it will reduce the fishing efforts and therefore preserve the natural reserves. Fishing vessels have features specific for the industry and are in little value for alternative uses. Therefore, this kind of subsidy is a harmless way for transformation of a dilapidating industry and serves as a conservation policy at the same time. As "good" subsidies are considered fisheries management programs and services, research and development (R&D) and conservation programs (see Part III).Additionally, Groves and Squires (2007) argue that in order to achieve success a buy-back program has to be supplemented by restriction of entry and capacity expansion. If the scheme lacks these conditions, the subsidy may well result in overexploitation of fishery stock- it turns into an **"ugly" subsidy**. These are subsidies with ambiguous effect which can lead to either decline or increase of the fishing efforts, depending the management framework in which they are applied.

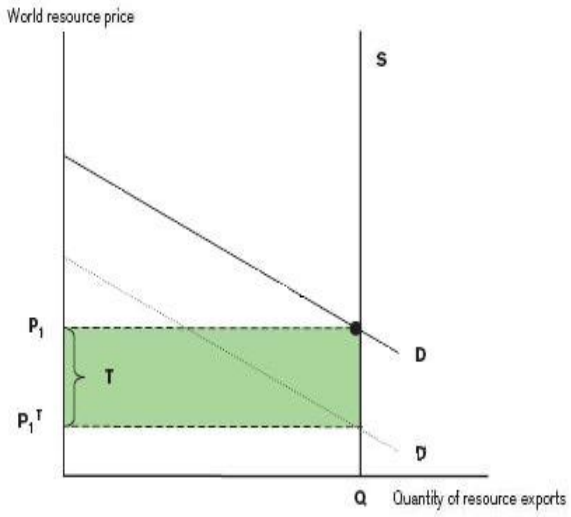
TRADE POLICIES

Economic theory suggests that trade policies may have such (disproportionate) effect on natural resources extraction rate that they become *de facto* domestic measures correcting the open access externality. In many cases when the regulator is unable to implement effectively regulations strengthening property rights or it is too costly to do so, trade policies may serve as second best solution.

PART II

Export taxes (static consideration)- According to the theory, export taxes applied by an exporting country with open access problem will raise its welfare and reduce extraction level of the resource. If the exporter is a so called **"large" economy**, capable to influence world prices, the imposition of export tax means higher price in the importing county which will diminish the demand and increase the long-run stock of the resource. The reduced consumption in the importing country implies more quantities available on the domestic market at a lower price thus leading to term-of-trade gain for the exporter and welfare loss for the importer ("beggar-the-neighbor" effect). However, before this effect to be achieved other factors have to be taken into consideration. One of them is the existence of **resource-based domestic sector** in a **"small" exporting country**. When there is no local sector, all the production will be sold abroad and the export tax will have only distributional effect, shifting rent from the production company to the government. There is no term-of-trade improvement in this case. The logic behind this assumption is illustrated in Figure 6. The supply curve (S) is vertical which implies that the supply is inelastic- there is fixed amount of the resource which can be provided. This is valid for exhaustible resources as well as a number of renewable resources such as whales, because at a given natural reproduction rate, the whalers are unable to catch more that the existing stock is, hence to deliver quantities according to the market demand. If the government introduces export tax (T), the production company will not be able to sell the resource on the foreign market at the increased price. Higher price will decrease demand (from D to D') for the product in the foreign market and part of the harvest will remain unsold. Therefore, the exporter has to internalize the exporting tax by diminishing its net profit (the shaded area between P_1 – price under free trade and P_1^T price with tariff, on the graph). In contrast, when there is a domestic market, the quantities which are not exported will be sold locally at a lower

Figure. 6 The effect of export taxes on natural recourses



Source: World Trade Report 2010

price. Because the lower price implies increased demand for the product, there will be no increase in long-run stock of the resource-exporting country.

Import tariffs- Import tariffs are trade restrictions applied by importing countries usually with the intention to protect local industry, as retaliation measure against export taxes adopted from supplying country or for other political, social and environmental reasons. Import tariff imposed by a large state will have the opposite effect of export tax in terms of welfare effect- it will improve the importer's terms of trade and deteriorate the terms of trade of the exporter. The logic is as explained above. If a country introduce import tariff, the exporting nation will have to lower its price in order to be able to sell the whole amount of the resource on the foreign market (this is in case there is no domestic industry to consume the resource). Therefore, the burden of the tariff will be carried out by the exporter. Because the import tariff raises the domestic price, it will lead to decrease in the demand and lower long-run stock for the importing country. This will act as a conservation measure for the open access resource because of the reduced harvest. On the other hand, as the exporter has to decrease its exporting prices (i.e. world price will drop) he will suffer terms of trade loss. However, the lower harvest means greater stock of the natural resource and expanded consumption possibilities for the resource-rich country (Brander and Taylor, 1998). Overall, the importer will lose from lower natural resource stock but it will be compensated from terms of trade gain and increased tariff revenue. The exporter will experience loss in the term of trade but he will gain from higher steady-state stock. When dynamic consideration is introduced in the analysis the effect of import tariffs will depend on what time pattern the regulator choose. Bergstrom (1982) explains that if the selected tariff is kept constant over time (in term of discounted present value) the extraction path will not be affected by the tariff.

Non-tariff barriers to trade- these are trade measures that restrict import but are not in the form of tariff. Such barriers can be for example quotas, customs and administrative entry requirements (documentation requirements, fees etc.) and import licensing. Import licenses are quite often used to control the import of products for conservation purposes. For example, endangered species covered by APPENDIX I of CITES can only be imported in exceptional circumstances and license permit is required for the importing country (how it is applied to trade with whale products see Norway, Part III). This type

of barrier is a good control measure for protecting biodiversity because it makes the trade more well-ordered and transparent.

Trade sanctions- Another types of policies are "trade sanctions"- trade-based policies which employ different trade instruments in order to force the partner country to reduce the level of resource extraction or abandon practice that distort the common welfare. A classical example of such unilateral trade measure is the Sea Turtle Case from 1999, where U.S. imposed embargo on shrimp imports from all the nations who do not use protection measures for endangered sea turtles in their shrimp harvesting. Although the World Trade Organization (WTO) Appellate Court concluded that such law constitutes "arbitrary and unjustifiable discrimination" between member-countries, U.S. was permitted to hold the embargo in a more flexible form (Berger, 1999). United States is a country which uses aggressively trade sanctions against countries which diminish the effectiveness of domestic or international conservation efforts with their commercial activity. In the case of whales protection on several occasions U.S. threatened to ban import of products from different whaling counties which do not comply with IWC regulations and guidelines (see U.S. Pelly Amendment in Part III).

Trade sanctions and GATT- Is the imposition of trade barriers and countervailing duties for conservation purposes consistent with the General Agreement on Tariffs and Trade (GATT) principles administered by the World Trade Organization (WTO)? GATT is a set of rules agreed upon by member-nations and WTO is the institutional body governing international trade under these rules. Article XI (1) of GATT prohibits imposition of quantitative prohibitions (embargoes) which are inconsistent with the objectives of free flow of goods, operation under comparative advantage and efficient allocation of world resources (McDorman, 1997). However, this regulation can be avoided in situations where: the trade embargo was explicitly permitted by another multilateral international treaty which supersedes the GATT; the trade embargo is required as a countermeasure for breach of a treaty; quantitative prohibitions are justified for conservation purposed under Article XX(b) and (g) of GATT. Under Article XX(b) governments can impose trade measures that are "necessary to protect human, animal or plant life or health" while under Article XX(g) the same are valid in cases "relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption". Trade measures taken under these exceptions must not constitute

"arbitrary or unjustified discrimination" against the partner countries. In this respect, CITES explicitly requires its members to adopt embargoes against imports and exports of endangered species. CITES overrides GATT in situations where the countries are member of both CITES and GATT. The situation is different when the states involved in a dispute are members of GATT but not of CITES. In this case, there is no straightforward answer and each circumstance needs to be examined separately.

Political Economy- Besides the welfare maximization and correction of market failure, a government may adopt policies, taking into account other consideration. Quite often these considerations stem from the political and economic pressure which different lobbies and interested groups exert on the rule-maker. The objectives of these groups are, in case of natural resource sector, to alter the regulations about access, extraction rate or trade with the resources in a way that comfort with their own interests but not necessary the interests of the public. Policies undertaken because of such political economy considerations may not reflect the socially optimal extraction path for the resource but lead to its depletion and welfare loss for society as a whole. From government point of view, these policies may be an easy way to secure political support and election financing (corruption), redistribute income (through resource-related subsidies and taxes) or protect domestic processors through export tax. Palsson and Durrenberger (1996) report that during the early years of the commercial moratorium, in order to keep their boats in operation lobbyist groups in Japan, Iceland and Norway exerted political pressure on the governments to increase the number of their scientific operations.

This part of the thesis presented the basic theoretical framework in which the countries analysis will be carried out. Despite the open access externality inherent for natural resources it showed that there are different domestic policies and trade measures which correct this "tragedy of common". However, they can also exacerbate the problem. How these measures are applied to whales as transnational living resources will be analyze in Part III.

PART III COUNTRIES ANALYSIS

In Part III, it will be shown how these policies and measures are applied by different countries, reflecting their attitude to the whales' issue. The analysis starts with world overview of the whales as resources and what are the main tendencies in the issue. Follows countries analysis where the focus will be on the three currently whaling- Japan, Iceland and Norway, and one non-whaling nation- USA, which is in the forefront of the anti-whaling movement.

WORLD OVERVIEW OF THE WHALES RESOURCES

In this section an overview of global tendencies concerning whales as natural resources will be presented. First, some information about the world fishing industry will be given, as whales are parts of that industry. Hence, both fisheries and whaling sectors share similar problems of over-harvesting, overcapacity and governmental subsidies distorting the market. Afterward it will be presented world tendencies in the whaling industry and whale-watching tourism.

Global tendencies in the fisheries sector- According to the Food and Agricultural Organization of the United Nations (FAO) in the year of 2005, 25% of the world's marine fisheries stocks were commercially overexploited or recovering from overexploitation; 52% were fully exploited; 20% moderately exploited and only 3% underexploited. Figure 4 in Appendix II presents the world principal producers of capture fish and their share in the global harvest. Japan, Iceland, Norway and USA are amongst the biggest fish producers accounting for 16% of the global capture production in 2007. In this respect, fisheries subsidies or Government Financial Transfers (GFTs) form an essential part of the income in the global fishery sector. In 2006 the OECD countries[27] distributed USD 6.4 millions in the form of subsidies to fisheries. The full amount of GFTS for developed countries represented around 19% from the total catch value in the same year. Significant amount of economic works (Porter G.,1998; Stone Ch.,1997; Pauly D. ,2002) shows that subsidies are one of the main reasons for world fish stock reduction. Still, the effects caused by subsidies on fisheries stocks depend on their use rather than their total amount. A report[28] from OECD classifies the GFTs in

[27] member countries of Organization for Economic Co-operation and Development (OECD)
[28] Review of Fisheries in OECD Countries 2009 Policies and Summary Statistics © OECD 2010

three categories: general services, cost reducing transfers and direct payments. General services, which in 2006 accounted for 74% of the total subsidies, include governmental management practices, regulation enforcement, infrastructure construction and habitat conservation programs. These policies do not put pressure on the resources as they do not increase the harvesting level through attracting new entries to the sector. Direct payments represent 19% of total GFTs (see Figure 5 and 6 for general services and direct payment to fishery sector for selected countries in 2006). Part of these subsidies are for decommissioning schemes which are considered "good" subsidies (see Part II), but other part was devoted to construction and modernization of fishing vessels and unemployment insurance which are referred as "bad" subsidies. Cost reducing transfers, estimated of around 6% of the total GFTs, comprise measures such as fleets' modernization, tax exemption and income support. According to the theory, these subsidies decrease the fishing effort, drawing more labor to the sector which, if no property rights exist, leads to depletion of the resources.

Tendencies and problems in whaling industry- Logically, the whales' resources share the same problems of overharvesting as commercial fisheries with the exception of 25 years moratorium on the commercial hunt. Japan, Iceland and Norway are, besides one of the largest producers of fish, the main catchers of great whales as well. Currently, only Iceland and Norway carry out commercial whaling while Japan harvest whales under scientific annual quotas. The reason for their dominance in world whaling is the fact that these countries have easy access to whale stocks which they utilize in their fishing industries. Moreover, the three countries share similar view regarding the international resumption of commercial whaling. Corkeron (2007) informs that the nations engaged in the harvest of marine mammal (and their supporters) claim that "(a) marine mammal populations are negatively impacting the abundance of commercial fish, and (b)cull of marine mammals, ostensibly to benefit fisheries, is part of "Ecosystem-Based Fishery Management" (EBFM)". The EBFM method of culling whales, in order to reduce their impact on commercially valued fisheries (the so called **"Whales-eat-fish"** argument) is supported by a number of studies: Blix and Folkow (1995); Murase et al. (2005). As whales are on the top of marine food chain this arguments may have its merits. However, critics of the method argue that there is no sufficient data to prove the claim that whales reduce fish stock available to fishermen but rather avoid the real cause of global fish decrease: overfishing (Corkeron, 2007).

PART III

The calls from Japan, Iceland and Norway to resume commercial whaling are not new. Since IWC meeting in Reykjavik, Iceland, in May 1991 the three nations sought to overturn the moratorium on certain stocks of fin and minke whales, as they regards them as capable to support commercial whaling without risk of extinction. At almost every CITES' meeting[29] since 1994 Norway and Japan propose minke whales (*Balaenoptera acutorostrata)* of West Pacific stock, the northeast Atlantic stock and the North Atlantic central stock to be transferred from Appendix I to Appendix II. This will allow the counties to trade with products from this species, issuing only export permit. So far these proposals have been rejected.

Tendencies and problems in whale-watching industry- The analysis of whale-watching industry as a separate section in every country's analysis is important as whale-watching is a conservation policy *per se*. As it proclaims non-lethal utilization of cetaceans, its natural purpose is protection of whales and their natural habitat.

In this sense, there are potential for whaling industry to impose external costs on the country's economy, particularly on whale-watching tourism (Parsons and Rawles, 2003). First, because the extractive (whaling) and non-extractive (whale-watching) values of the whales are mutually exclusive: the increase in harvesting rate will reduce the population size, thus reducing non-harvesting opportunities (Moyle and Evens, 2008). Second, canceled whale-watching trips and foreign customers' boycott are other examples of external costs caused by whaling (see Japan and Iceland below). In addition, one country may impose trade sanctions on other, which engaged in whaling activities, threatens the success of domestic or international efforts for conservation of whales (see USA). On the other hand, a number of cases show that it is possible the coexistence between whaling and whale-watching industries (Japan). There are even cases where whaling companies offer whale-watching voyages at the same time (Iceland).

What are the motives for the pro- and anti-whaling countries to support ultimate positions? Is the decision of one state to commence whaling economically grounded or there are other objects sought with this act. Why would anti-whaling countries seek to impede other nations from whale hunting? All these questions are addressed below.

[29] CoP.9, CoP.10, CoP. 11, CoP.12 and CoP.13- meetings of the Conference of the Parties (CoP) of CITES

PART III

JAPAN

A country between good management and bad international image

A COUNTRY OVERVIEW

Japan is one of the biggest producers and a major net importer of fish products in the World. For 2006 Japan fish capture amounted of 4,305,137 tonnes[30] which is about 4,8% of the world landing. In the same year Japan imported fish worth USD 12.7 billion and exported products in the same category worth USD 1.3 billion (which is one tenth of its fishery import). The country occupies a total area of 377 801 km² with Exclusive Economic Zone (EEZ)[31] of around 4,050,000km2. According to data from FAO, the estimated employment in coastal and offshore fishery for 2006 was 212,470 people which is less that 1% (0,17) of the population. Total fishing vessels were 321,017 at the same year (OECD statistics). For comparison, in 1996 287,380 people were employed in the fishery sector (0,23% of the total population) and 378,431 vessel were in exploitation. Nobuyuki Yagi[32] reports that there are about 6,200 fishery villages along the coastline of Japan, where fishery is a main source of revenue in the communities. However, the fishery industry experienced a steady decline in the last twenty years. According to data from OECD, fish capture (not including aquaculture) dropped from 11.46 million tonnes in 1986 to 4.3 million tonnes in 2006. The reasons for this decrease are different factors- deterioration of stock status of individual species, reduction of fishing efforts etc.

Subsidies to the fishing sector

Japan's Government Financial Transfers (GFTs) amounted of USD 1.9 billion in 2006 (OECD, 2010). Almost 99% of the GFTs were spent on general services such as construction of public infrastructure linked to the fishery industry (fishing ports, navigation roads), scientific research, surveillance and control, official foreign development aids, etc. Japan has no payments for new vessels or fees for access in foreign waters. The only direct transfer is for reduction of fishing fleets (so called buy-back schemes); in the period of 1981 to 2007 a total of 1 640 vessels were scraped. In order to prevent resale or reuse, the fishing licence of the scrapped vessels are revoked.

[30] FAO statistics
[31] Exclusive Exonomic Zone- a seazone stretching out to 200 nautical miles from the shore, over which a state has exclusive rights; referred also as territorial waters/sea.
[32] Nobuyuki Yagi, Sustainable Development and Subsidies in the Fisheries Sector- a Case in Japan; Fisheries Agency, Government of Japan

An example of a "good" subsidy is the Japan's interest rate subsidy, which is 1,25%-0,01% difference in the market and subsidized interest rate. The program is designed to help owners of small boats and fishermen families to cope with structural adjustment of the sector and does not contribute for increase in fishing capacity. In this sense, Nobuyuki Yagi argues that the fisheries subsidies do not cause "unwelcomed" externalities (over-harvesting and trade distortion, see Part II) because Japan has sound regulatory measures in place and the fisheries subsidies do not result in increase in the domestic production . This is so, due to the upper limits on capacity and efforts which the government set through mandatory licensing, total allowable catch (TAC) for some commercially valued species and regulation on boats construction.

Domestic market for whale products

Although commercial whaling is forbidden in Japan, Ishihar and Yoshii (2000) reports that currently there are several legal sources for supply of whale products: scientific (research) whaling, small-type coastal whaling, drive and hand harpoon fisheries, by-catch and stranding, frozen stockpiles from catches before the moratorium and import from other nations (see Table 4 in Appendix II). While the scientific whaling supply around 1,000-2,000 tonnes every year, small type whaling harvests mainly dolphin and porpoises (cetacean which are not protected under the IWC ban). The official website of Japanese Fishery Agency (JFA) states that annually about 2,000-3,000 metric tons from legally caught whales are sold on the Japanese market.

According to the trade theory revised in Part II, the policies and measures that restrict domestic consumption of the natural resource (in both, the exporting and importing countries) – "have a disproportionate impact on exports or imports and become *de facto* trade instruments". As discussed earlier the existence of domestic market for whale products means that the imposition of export tax will be less effective instrument for protecting whale stocks since the lower prices the domestic processors have to pay will increase their demand for more quantities.

Annual consumption of whale products (including species not covered by the ICRW) for the period of 1995-1998 was 3,000-4,000 tonnes (Ishihara and Yoshii, 2000). Statistics from World Bank shows that the population of Japan in this period was between 125,439,000 (1995) and 126,410,000 (1998). This means that annual consumption of whale products was only about 0.23-0.31kg per capita for the period. Compared with other meat products, the consumption of marine mammals appears to be

only 1% from the total consumption of meat during the year (see the Table 5 in Appendix II). Muller (2007) confirms that only 1% of the population eats whale meat on a regular basis. In fact, in 1998 19% of the meat consumption is allotted to pork meat, 18,6% to pelagic fish and 12,6% to beef. While whale meat was an integral part of the every-day food of the Japanese years ago, now it is not considered a popular dish. One of the reasons for that is the shortages of whale products after centuries of massive stock depletion and the availability of cheaper substitutes which caused the whale meat consumption to decline over the years. "Times have changed," said Mitsuo Matsuzawa, a Tokyo seafood seller. "Whales used to be an important source of nutrition for generations after [World War II], when we had nothing to eat. Nowadays people buy and eat meat not as a main dish but as a delicacy or out of nostalgia for past dinners" (Ito, 2007).

Despite the observed unpopularity of whale meat in the diet of today's Japanese, the government tries to popularize whale meat through subsidized school lunch programs. Hamaguchi adds: "It is important for us to provide the whale meat dish in a school lunch program for the continuation of whale meat in Japanese food culture". However, previous campaigns which aimed to stimulate consumption did not turn to be successful (see Part I).

The persistent endeavor of the Japanese government to expand whale meat market can be explained with the fact that the country has easy access to cetaceans stock in territorial waters and therefore use its strategic position to utilize the available abundance. As Hisashi Hamaguchi (2009) says: "Whales are renewable food resources which can be used sustainably".

All the stated above suggests that the market for whale products is very limited despite the governmental efforts to expand it. Furthermore, Endo and Yamao (2007) report that the industry had been in a decline for many years before the international moratorium took place (see Table 1 in Appendix I for the trend in whales catch). Referring to the theory from Part II, the small market and low domestic demand for the resource could preserve the natural stock from overexploitation both in case of autarky and free trade, unless distortions (such as GFTs) are introduced to the market.

Subsidies to whaling fleets

The whaling industry in Japan, in the form of scientific research, is dependent on government subsidies. Tinch and Phang (2009) report that Japan has one of the highest

boat fuel subsidies in the world- US$0.25 per litre in 2006. As already explained in Part II this is an example of "bad" subsidy. Also, a governmental program from 2008 aiming to help fisherman overcome the world fuel crisis includes: US$344 million for purchase of fishery products; US$172 million in interest-free loans for energy-saving measures and US$69 million for projects which reduce fuel consumption. There are also subsidies for research whaling, commissioning fee for coastal research whaling, supplementary budgets for security against protest action from Sea Shepherd and Greenpeace and promotional campaigns (which are indirect form of subsidy). According to the theory, all these measures will reduce whaling efforts therefore attract more labor to the sector and, as consequence, lead to overharvesting of the whales stock.

The study from Tinch and Phang (2009) claims that despite the fact that the subsidies set the whale products price higher than the equilibrium market price, the whaling industry registered losses in last 20 years. They argue that the "existence of increasing levels of unsold whale meat, coupled with a decline in prices is strongly suggestive of a problem of declining demand for the product". According to the theory described in Part II, the presence of subsidies when demand is low means that the country will harvest and export its entire natural resource stock and make welfare losses under free trade. However, in the case of Japan several considerations have to be taken into account before a conclusion on the effect of subsidies is drawn. First, there is only one operator in the industry - Institute for Cetacean Research (ICR) which is under governmental jurisdiction. This clearly tightens the access to the whale stock and strengthens the property rights. Second, the harvest is implemented via quotas which situate the exploitation point below the level of open access harvest (see Figure 3 in Part II). Third, because of CITES ban for trade with whale meat and derivatives there is no trade as such. The only trade is between the countries objecting the Convention (such as Japan, Norway and Iceland). All the three parties have strong regulation regarding harvesting of whales which implies that none of them will deplete its resources when trade is opened up.

However, in order to ensure that there is no unregulated harvesting and no meat from illegal sources enter the market the Japanese government has to establish strict control of the whaling and monitoring on the whales market.

Monitoring and control system-DNA register

The aim of monitoring and control of the market is to prevent whale products from

illegal origin to enter the trade. In this respect, it is technically possible to identify every species, entering the market by employing DNA analysis (Ishihara and Yoshii, 2000; Baker et al., 2008). At the present, only samples from species taken in scientific rprograms are collected in a DNA register. Although JFA recommends, sample to be taken from frozen stocks, stranded and incidentally caught animals, it is not mandatory. Reserves of frozen whale meat are scattered all over the country, in different wholesalers and retailers which makes impossible to quantity these stockpiles. Whale meat imported from other nations in also not subject to DNA registering. These are shortcomings of the current management system since it is not possible to distinguish between legal and illegal source of the whale meat. As explained in Part II, the enforcement of sound property right over the resources is possible only with effective control and monitoring system in place. Therefore, in order to proof as an effective market monitoring tool the DNA register has to include samples from all whales taken from legitimate sources.

Market for substitutes

Before the whaling moratorium, small cetaceans (dolphin and porpoises) used to be separated market from those for whale meat (Ishihara and Yoshii, 2000). After the ban the supply of dolphin meat steadily increased, in response to change in the demand (Kasuya, 1989), emerging as a substitute market for whale meat. This is valid mainly for areas where meat of these species is traditionally eaten- fishing communities in Taiji, Abashiri, Ayukawa, Wada (Hamaguchi, 2009). In urban areas, where whale meat is not basic food component, it is substituted from pork and beef.

Consequently, the existence of market for substitutes might be a positive sight from the prospect of lower demand for whale products but it also may lead to the overexploitation of other endangered species.

Scientific research program

In Article 8 of ICRW it is stated that any government, member of the Convention, can issue “a special permit authorizing that national to kill, take, and treat whales for purposes of scientific research”. Under this rule the Japanese Government issued permits to the Institute of Cetacean Research (ICR) which undertook two programs for whale research- Japanese Whale Research Program under Special Permit in the Antarctic (JARPA) from 1987 and Japanese Whale Research Program under Special

Permit in the western North Pacific (JARPN) for whaling in North Pacific. JARPN began in 1994 and was originally intended for five years. After revision of its results it was conducted a two-year feasibility study of the second phase of JARPN (JARPN II) in 2000 and 2001. Total catch of great whales under scientific permit in the period of 1988-2009 was 12,393 animals (see Table 2 in Appendix I). Institute for Cetacean Research contracts a single whaling company, Kyodo Senpaku, to provide the vessels and crew for the research expeditions (ICR is a public-service corporation and cannot make profits). The by-products from the catch are released twice a year to Kyodo Senpaku to sell them at a price fixed to wholesalers and local authorities (Tinch and Phang, 2009). The purpose of the sale is to cover part of the costs of whaling and research. The rest of the operations expenses are covered by government subsidies. The single "owner" of the resource guarantees that there is strict control oven entry in the sector.

The paper "Why Whale Research?" summarizes the official position of Institute of Cetacean Research regarding scientific whaling: because the land resources are unable to sustain the growing world population, for the purpose of food security, it is necessary marine living resources to be fully utilized. "The data obtained through the Japanese take of whales and their scientific analyses will, as its primary purpose, eventually lead to the resumption of sustainable whaling". Also, for the rationale of "safe management of the whale resources" Japan considers appropriate the application of lethal (besides to non-lethal) research methods. The scientific programs use lethal methods in order to estimate what is the age composition, stock structure, diet, chemical and pollutant contamination of the animals. However, critics of the lethal research argue that there are non-lethal techniques, which could provide more efficient and accurate data for the species (WWF, 2005). Also, while studying the stomach content of a dead animal provides only a snapshot of the last prey consumed, isotope analysis of a skin sample offers long-term view of the whale's diet.

Japan employs the ecosystem-based approach EBFM for the management of cetaceans that uses scientific data to run mathematical simulations which can illustrate the predator-prey relationship and estimate the effect of increasing whale stocks on fishery resources. The results of the programs show that the stocks of many whales are increasing and are abundant enough to be utilized for industrial purposes. Also whales eat tremendous amount of fish thus competing with fishermen and whales are major reason for the global depletion of fish. Therefore, in order to restore the overall balance

of the ecosystem whales should be **culled**.

However, it is widely agreed in academic society that overfishing by humans is the main cause of fish reduction on a global level. Although further studies need to be undertaken in this area, so far there are no evidences for large-scale competition between fisheries and marine mammals ((Kaschner 2004; Morissette 2007) and what will be the ecology consequences of culling ((Paine et al. 1998, Scheffer et al. 2001).

All this shows how science can be used for the justification of **political economy**. Behind the "whales-eat-fish" argument can well stand commercial interests of groups which need publicly acceptable arguments in order to legalize the exploitation of cetacean resources.

Whale watching

Although Japan is mostly associated with whaling and the controversies around its scientific program, the country has the largest cetacean watching industry in Asia (by total expenditure). The industry is growing fast with a rate of around 6.4 % (2008) annually and nearly USD 23 million generated in the form of total revenue[33] (see Table 6 in Appendix II).

Specific for the industry is that 90% to 100% of the visitors are domestic tourists. Japanese have an attitude to whales and whale watching which does not fit the westerns perception for the matters. While large part of the international public is prepositioned anti-whaling and accepts cetacean-watching tourism as the only mean for whales' use, Japanese find completely normal to go whale-watching one day and eat whale meat another. Rod Campbell[34] states that while there are as passionate Japanese environmentalists as foreigners, and people determinate to protect their cultural identity with whaling, majority of the population stays in between. This fact is resembled from the different types of operators which run the industry. Some of them emphasize on conservation and education in their activities other use the opportunity to earn extra money from day-trippers, while stressing on the fact that it may hinder future efforts to resume commercial whaling.

Referring to cultural heritage Segi,Shio (2003) explains why whale-watching tourism is

[33] The sum of direct revenue (the benefits minus costs for annual whale-watching tours) and indirect revenue (earnings from travel, food, accommodation, souvenirs and others associated with whale-watching tourism)

[34] **Rod Campbell-** personal reflection on whaling and whale watching in Japan, taken from Whale Watching Worldwide: Tourism numbers, expenditures and economic benefits, © 2009 A special report from IFAW

not feasible in places with traditions in whale hunting. The Japanese town of Taiji has long history in small-type coastal whaling, providing up to 30% of the town budget in 1960s. After the international whaling moratorium took place the development of whale-watching tourism was considered to be an alternative source of employment in the area. However, local people perceived the whale-watching tourists as identical to anti-whaling campaigners and therefore were anxious the whale-watchers will interfere with their right of self-identification with whaling. This is an example of how different **non-use values**, revised in Part I, may play a key role in the development of one industry. Because for the local Japanese the **altruistic** and **bequest value** is the knowledge that they will be able to exercise their whaling tradition now and in the future, the idea to replace these customs with something quite different as a conception does not seem to be a plausible solution.

Segi (2003) shows that in neighboring towns, where whale hunting have no deep traditions, the coexistence between whale watching and whaling companies is possible and mutually beneficial. This is achieved thanks to several factors: first, cetacean whaling companies were established by former hunters who knew the problems associated with fisheries; second they did not operate during dolphin hunting seasons which avoided the risk of tourists witness dolphin slaughtering and most important whale-watching operators and whalers shared information about location and type of species. This cooperative behavior makes possible the existence of both industries. Even though whalers receive no direct benefit from the information they share, the information which they receive from operators regarding whale spots is vital for their work. As both industry have interests to coexist and cooperate none of them will act for the depletion of the resource. Therefore this positive market externality acts as a conservation measure of cetacean species.

EXTERNAL TRADE WITH WHALES PRODUCTS

The import of whale products is regulated by the Japan's Decree of Import Trade Control. In order to be brought in the country, the products first must be approved by the Ministry of International Trade and Industry (MITI). Then a standard CITES import procedures can be started (see CITES in PART I). The government prohibit the import from non- IWC member countries as well as countries which are member of the Commission but do not hunt whales themselves. According to the Japanese trade regulations "any importation that threatens the conservation efforts carried out by the

IWC will be denied" (Ishihara and Yoshii, 2000).

There are no specific regulations which control the trade of whale products within Japan. However, in cases of smuggling, the Customs Law and the Foreign Exchange Control Law of Japan applies even when the products have circulated into the market for some time (Ishihara and Yoshii, 2000).

According to the trade theory revised in Part II free trade exacerbates the exploitation of the natural resources. This is the case, when under common pool ownership one whaler is unable to exclude the others from hunting the same whales stock, thus willing to harvest as much as he can until the population is so depleted that the profit he earns do not justify the increased whaling efforts. In order to deal with this market externality governments adopt different trade measures and domestic policy which restrict open access to whale stock, thus reduce exploitation level and help for the conservation of the species. One such measure is the import tariff. The theory suggests that imposing import tariffs on trade with open-access natural resources will increase the price (and decreasing the quantities) of the product in the exporting country thus diminishing the rate with which the resource is harvested. Applied to trade with whale products it will act as a conservation measure since the lower rate of harvest will allow the whale stock to recover and match the temp of exploitation.

However, World Trade Organization (WTO) data shows that Japan has free import of whale oil (HS 2007[35], code 150430010) and whale meat (HS 2007, code 020840011). The statistics also reveals that there is no import of whale oil and whale meat for the period of 1996 to 2007. In 2008 when 66 573kg (with value of US$1 167,300) were imported duty-free from Iceland. According to OECD data, in 2009 meat from marine mammals (including whales) with value US$ 22,540,37 were imported from Iceland.

Japan imposes an import tariff of 4,2% on import of meat and edible offal of whales and other marine mammals (HS 2007, code 021092000). WTO data shows there is no trade in this category.

According to the official statistic, Japan do not export whale products except in item with code 150430 (HS 2007)- Fats and oils and their fractions, of marine mammals. In the period of 1996- 2008 Japan exported products from this category worth US$ 455,822, facing import tariffs of maximum 5% (MFN tariff in Malaysia, 2001).

[35] HS 2007-H armonized Commodity Description and Coding System (HS)of tariff nomenclature is an internationally standardized system of names and numbers for classifying traded products developed and maintained by the World Customs Organization (WCO).

However, the share of marine mammal oil in the total export of animal oil is quite modest. For comparison, the total export of group 1504 (fat and oil from fish and marine mammals, HS 2007) only in 1996 was 9,704,459 US$ and maximum tariff rate 6,4% (Canada).

Trade with whale products follows the pattern of trade with fish product in Japan. The country mostly imports rather than exports whale products. Due to IWC moratorium on commercial whaling and CITES prohibit on trade with whale product the turnover in this industry is relatively small.

International image and boycott

Despite the governmental efforts to regulate the business and ensure that no overharvesting of whales will occur, international disapproval and customers boycott may impose much larger cost that the profits which whaling industry could earn. In 1974 the Animal Welfare Institute (AWI) in the USA initiated boycott of and Japanese products. Thousands of Americans sent letters to Japanese government and various Japanese companies situated in United States with calls to stop killing of whales. Also, since 1970 Greenpeace and Sea Shepherd regularly organize ocean voyages with the aim to enter in direct confrontation with Japanese whaling fleets. Sea Shepherd is a non-profit organization known for using more aggressive approach, such as scuttling, disabling and ramming whaling vessels, in their marine conservation actions. A publication on the official website of the organization states: “If the average value of a whale is a quarter of a million dollars, then we succeeded in depriving the Japanese whaling fleet of around $132 million USD”.

Therefore in order to estimate the potential benefits of resuming industrial whaling Japanese politics has to consider also the indirect costs for the economy.

CONCLUSION

There is considerable amount of controversies surrounding Japanese whaling. From one side the government tries to enforce different domestic measures (catch quotas, DNA register etc.) which aim to strengthen the property right regime and limit the entry to the whale stocks. From the other, low domestic demand, governmental subsidies and whales’ cull under deceiving scientific arguments bring distortion in the market and may lead to overexploitation. The relentless position of Japan to resume commercial

whaling creates quite a negative image of the country on international level. Therefore, even if whaling is resumed on a sustainable and safe from extinction level, the costs of industrial, tourists' and non-government organizations' boycott may well "outshine" the commercial benefits.

ICELAND

Culling whales as fishery management

A COUNTRY OVERVIEW

Iceland is an island country with total land area of 103,000 km² and water territory (EEZ) of 758,000 km². Fishery is a main sector of Icelandic economy accounting for 40% of export earnings and around 12% of country's GDP[36]. The total population for 2007 was 308,000 people, from which 7% are employed in the fishing industry (OECD, 2010). For the same year total fish production was 1,404,066 tonnes live weight and per capita consumption was 44-47 kg . The landings of marine fish accounted for 1.7% of the world's catches in 2007, which placed Iceland on 15th position of main exporting countries in the world (FAO, country profile).

Fisheries industry in Iceland is regulated by the Ministry of Fishery which annually determines the Total Allowable Catch (TAC) for every commercially important fish stock, based on scientific recommendations from Icelandic Marine Research Institute (MRI). The size of each vessel's individual transferable quota (ITQ) is multiple of TAC for specific fishery and the vessel's quota share.

Icelanders have rather mixed opinions on whaling. Some welcome the revival of commercial whaling as a source of additional earnings; others are afraid that this will ruin the whale-watching business. Inter Press Service reports (REYKJAVIK, Apr 16, 2010) that the hunting and processing of 150 minke whales and 150 fin whales would provide 80-90 working places on a yearly basis. On the other hand, four of ten whale-watching companies provide 120 jobs during the peak period and 40-50 outside of this every year. A survey from Nov. 2006 shows that 60% of the nation supported the resumption of the industry, while in Feb. 2007 only 40% supported this decision[37].

[36] Central Intelligence Agency (CIA) of USA
[37] Þorsteinn Siglaugsson, Guðmundur Guðlaugsson (2007), Whaling and the Commercial Interests of Iceland, Sjónarrönd ehf.

Fisheries subsidies

Although Iceland allocates subsidies to the fishery sector, they are low compared to other countries (see Figure 6 in Appendix II). In 1970s the government established funds (such as Catch Equalization Fund, Fishing Vessel Oil Price Stabilization Fund, Fisheries Loan Fund and the Regional Development Fund) which were intended to help the fishing industry in various aspects. They were designed to redistribute fishermen income, assist fishermen in modernizing old and purchasing of new vessels, mitigate the volatility in boat fuel prices, provide investment funds for processing plants, grant fund for purchasing of domestically build boat etc. (Schrank, 2003). All these represent cost reducing subsidies which have the effect of decreasing the fishing efforts and expanding the harvesting capacity. As the theory suggests, this, from its side, will lead as a consequence overfishing and depletion of the stock.

A buy-back program was introduced in 1980s with the aim to reduce fishing capacity (a "good subsidy). However, it did not produce the expected effect and was abandoned in 1998 (Schrank, 2003).

According to OECD report (2010) on fisheries Iceland do not distribute direct GFTs to the fishing or processing industry. The government funds general services in the face of research centers, such as Marine Research Institute (MRI). In terms of cost reducing policy the government provided occupational training in 2007 for workers in fish processing at the amount of ISK 12 million. However, a recently undertaken research program for fuel-saving system may reduce the CO2 emission, which is its original aim (Ministry for the Environment in Iceland, 2006) but it will also act as a "bad" subsidy, having possible adverse impact on Icelandic fish stock.

Domestic market for whale products

Icelandic commercial whaling has over 120 year history with a harvest peak in the early 20th century when there was a high demand for export of whale oil. Iceland joined the IWC in 1949 but left and rejoined the Commission several times later. In 2006, Iceland resumed commercial whaling, with a quota of 39 whales—including 30 minke whales and 9 fin whales (WDCS Press, 2008).

Considering the small size of the country, the domestic market is limited and most of

the whale products were exported to Japan during the years[38]. Thus, regarding market opportunities and the current situation of restricted international trade, "it is a precondition for any whaling in Iceland to be able to export whale products to Japan"[39].

Due to various factors eating habits in the Icelandic population have changed and people substituted the whale meat with other meat products. Siglaugsson (2005) reports that when minke whales meat from the scientific program in 2003 entered the market and sold initially for the price of 1000 ISK/kg falling to 500 ISK/kg afterward. Hagkaup hf., the retailer chain which offered the meat, explains that at the beginning the product received considerable attention and chefs were drafted to promote it. The costumers were willing to try the new product but subsequent purchase did not take place and 23-27 of total 37 tonnes remained unsold. During that time the price of beef was 300ISK/kg, lamb- 270 ISK/kg and pork- 170 ISK/kg[40]. According to Siglaugsson (2005) the estimated Iceland's domestic market for whale meat in 2003-2004 was between 5 and 15 tonnes a year. In comparison the total supply of meat in the same period was close to 24,800 tonnes (2003) and 24,600 tonnes (2004) respectively (FAO statistics). A public poll from 2006 indicated that only 1.1% of Icelandic households eat whale meat on a weekly basis[41].All these estimates indicate that the whale meat market in Iceland is small and the demand is relatively low.

Drawing on the theory presented in Part II it can be made several inferences: first, although the size of the domestic market is small in relative terms it is actually not. There are only few countries in the world where domestic market for whale products exist and Iceland is one of them. Therefore imposition of export taxes or import tariff will not have the desired effect of reducing harvest because there is a local industry to absorb the resource unsold on the foreign market. Second, the theory predicts that with low demand for the resource, when trade is opened up the country with weak property rights will start to export to the country with strong property rights thus depleting its stock. However, Iceland has sound control and monitoring measures which is indicator for strong property rights over the whaling resources.

[38] Siglaugsson Þorsteinn (2005) The Whale Meat Market, Study on Current and Possible Markets and Cost of Operations in Minke Whaling, GJ Financial Consulting, Reykjavik, 1.6.2005
[39] citation of Iceland's Fisheries Minister, Dr. Altherr Sandra (2003) Iceland's Whaling Comaback, Preparation for the resumption of whaling, an analysis for PRO WILDLIFE, WDCS and HSUS
[40] Source: Farmers Association of Iceland
[41] Capacent Gallup Poll for Iceland, 2006

PART III

Control and monitoring of the market and regulatory regime

Iceland enforces a DNA register for every species caught which have to ensure there are no premises for IUU fishing or illegal trade. According to the Act on Whaling (No. 26/1949) it is illegal to conduct whale hunt or process whale products without a permit from the Icelandic government. The Act also obligate the Minister of Fisheries to issue such permit based on scientific advice from MRI[42]. It stipulates penalties for breaking the regulations, including the possibility of fines and imprisonment. Besides the restrictions on whaling operation imposed by the Act, the Minister of Fisheries has the power to put additional conditions on any permit issued.

Scientific whaling

Iceland left the International Whaling Commission in 1992 and re-adhered to the ICRW in 2002 with a reservation to the commercial whaling moratorium. In 1985 Iceland, like Japan, submitted proposals to the IWC for conducting whaling for research purposes. At the period of 1986-1989 a total of 292 fin and 70 sei whales were taken. Despite the IWC resolution [IWC/ 37/27] from 1985 which requires whaling nations to use the scientific by-products primarily for domestic consumption, Iceland exported about 77% of the whale meat to Japan[43]. The goal of the program was to collect enough data for the purpose of informed advice for the cetacean management before the commercial moratorium take place. As a result of the program the first reliable estimates of the exploited species abundance in the central and eastern parts of the North Atlantic were provided[44].

The scientific whaling restarted again in 2003 with a five-year research program on minke whales carried out by the Marine Research Institute (MRI) of Iceland. Between 2003 and 2007 a total of 200 minke whales were caught. The stated objective of the program was "to increase understanding of biology and feeding ecology of important cetacean species in Icelandic waters for improved management of living marine resources based on an ecosystem approach" (IWC, website). Put in plain language, by studying the stomach content of mink whales the program aimed to estimate what the whales eat, how much they eat and how they interact with other species (such as cod, capelin and shrimps) which are of commercial importance for the fishing industry (MRI

[42] Consideration of Proposals for Amendment of Appendices I and II, CITES, Cop.13, Prop. 4, 2-14 Oct. 2004
[43] Darby, Andrew (2007), *Harpoon: into the heart of whaling*, Allen & Unwin, pp. 179–180
[44] Marine Research Institute of Iceland, http://www.hafro.is/undir_eng.php?ID=15&REF=2

website).

Corkeron (2007) explains how scientists in Iceland uses Ecosystem-Based Fisheries Management (EBFM) in order to justify the culling of whales. This management approach is commonly used from nations which clime that "whales consume huge quantities of fish making the issue a matter of food security for coastal nations" (St Kitts & Nevis Declaration, IWC, 2006)**.** The approach resembles the new tendency in scientific marine management which takes into account of interaction between different species in the ecosystem. The primary goal of the effective fish management is to assess the **indirect value** of a given species (minke whales) which has an impact on other species of importance for the local economy (capelin). In this sense, adopting EBFM which use lethal sampling of minke whales in order to estimate what quantity of fish they eat will give the scientists a base for modeling the influence of marine mammal predation on the fishery of interest. However, Corkeron (2007) points that there is high level of process uncertainly (variability inherent in the system: the whales do not always eat the same things at the same place) and measurement uncertainly (the measurement estimates are not 100% sure) regarding the input variables in the model. This makes the estimates for the amount of fish consumed by whales, easy to "twist" and adopt in politically palatable management decisions even though they do not present the reality. Therefore, he argues that the results of research programs which show that whales eat too much fish may be rather **political** than scientifically based management.

Commercial whaling

The declaration of Icelandic Fishery Ministry to resume commercial whaling states that "The annual catch quotas for fishing and whaling are based on recommendations from scientists, who regularly monitor the status of stocks, thus ensuring that the activity is sustainable". Commenting on the program results about increasing abundance of fin whales the Iceland's Minister of Fisheries, Einar K. Gudfinnsson, said in front of Fréttabladid: "The whale stocks are very large and continue to increase in size, which has a negative influence on the size on the stocks of other marine species. These results show without a doubt that there is a biological prerequisite for whaling." However, he continues, „whaling is like any other industry; its profits decide whether it will continue. Therefore whaling will automatically discontinue if the meat doesn't sell." (Iceland Review Online-IRO, 23.07.2007).

PART III

Commercial whaling is implemented under annual quotas set by the Ministry of Fisheries. Like Japan and Norway, Iceland can set the whales catch quotas unilaterally. 38 minke whales were killed in 2008. Iceland Review Online reports that 125 fin whales were killed in 2009. Total of 204 whales (148 fin whales by the whaling company Hvalur, 50 minkes by Hrefnuveidimenn and 10 minke by Fjördur) were taken in the season of 2010 (see Table 7, Appendix II).

According to the theory given in Part II, if only an amount equal to the growth rate of given renewable resources is harvested, it will allow for sustainable continuation of the specie and prevent the stock from depletion. In this respect, a study (not publicly available) conducted by the University of Iceland Institute for Economic Studies on behalf of the Ministry of Fisheries and Agriculture makes an assumption that the fin whale stock in Icelandic waters is 22,100 animals and that of mink whale- 53,000 animals. The study shows that if 150 whales of each stock are taken annually, the balance will be sustained, but if more that 330 fin and 800 minke whales are caught, the stocks will collapse. Also, if 150 animals of each species are harvested every year "the cod fishing quota could be increased by 2,200 tons, the haddock quota by 4,900 tons and the capelin quota by 13,800 tons" (IRO, 30.3.2010). This will bring additional ISK 12.1 billion (USD 94 million) to the fishing industry.

Besides the economic and ecological reasons, there are other motives which Icelandic commercial whaling might be grounded on: lobbies interests. Primary, there is difference in the technology employed for the killing of minke and fin whales. While minke whales are relatively small and can be hunted with fishing boat and a harpoon gun, fin whales are large animals and for their hunt a specially-build whale catcher (equipped with large-caliber explosive harpoon) must be used. A single owner of such vessels is the company Hvalur H/F (Whale Ltd) which is owned by a member of conservative Independent Party in Iceland (Brydon,1990). Altherr, Sandra (2003) presumes that thanks to good political connections the company managed to secure exclusive contract for hunt of fin whale at that time. Its vessels were used in the research whaling of 1986 to 1989. Because these types of ships cannot be converted for fishing during the whole year, in order to stay in operation it needs to go hunting for whales. Here is how **political economy** comes into place. The industry objective of fully utilizing the excess capacity may induce the need for a large fin whale quota. As a consequence it may introduce distortions in the most optimal extraction path of the resource and lead to depletion of the whales stock.

PART III

Whale-watching tourism

The beginning of whale-watching industry in Iceland dates back in 1991 when 100 tourists were registered for the single whale-watching operator in the country[45], brining £35,000 of total in revenue (Hoyt, 1995) (see Table 8 in Appendix II). Since then the number of whale-watchers continued to grow reaching 114,500 visitors in 2008 (O'Connor at al., 2009).

How whaling and whale-watching coexist in Iceland speaks the fact the whaling company Hrefnuveidimenn was considering offering whale-whaling trips on its hunting ships. Feldstein (2010) explains that this is a way for the company's investment in new vessels to pay off, since the whaling season is only 100-day long. Offering whale-watching trip all the year around will allow the company to keeps its ships in exploitation. On the other hand, Björgvinsson (1997) reports that in 1997 all operators were interview if they support resumption of whaling and only two responded positively. A survey conducted the same year shows that 54% of the tourists respond that, if whaling is resumed, it will have a negative effect on their choice of Iceland as a holiday destination.

EXTERNAL TRADE WITH WHALES PRODUCTS

Iceland review online reports that over 82 tonnes whale products were exported from Iceland in 2008; 125 fin whales were killed in 2009 (equivalent of 1,472 tonnes whale products). From these, 372 tonnes were exported to Japan. Total of 204 whales (148 fin whales by the whaling company Hvalur, 50 minkes by Hrefnuveidimenn and 10 minke by Fjördur) were taken in the season of 2010 (see Table 9 , Appendix II). Iceland's main trading partners in this sectors are Japan, Faroe Islands and Denmark. According to WTO data Japan has duty-free import of whale products. Regarding Faroe Islands (as a self-governing part of Denmark) trade with Iceland is duty-free under European Free Trade Association (EFTA). Trade between Iceland and Japan is legal since all three countries have reservations on the CITES listing of common minke whales on Appendix I. Faroe Islands is not a member to CITES.

According to the assumptions made in Part II, harvesting in situation of free trade means that the harvest of natural resources suffering from open access problem will attract unlimited labor entry which will ultimately exhaust the resources. However, considering the regulatory regime in the whaling sector of Iceland it is unlikely that the

[45] Sue Fisher, Whale and Dolphin Conservation Society, James St West, Bath, BA1 2BT

country will exhaust its whale stock.

Boycott

Despite the fact that whaling is part of the traditional fisheries industry and efforts have been made for strengthening the control and management of harvest and trade, whaling could have negative impact on Iceland external interests and international relations. In the context of current debates for the acceptance of the country in the European Union (EU), German parliament declared that it will grant EU membership only if Iceland stop whaling (Iceland Review Online, 16.6.2010). Also customers' and activists' boycott may impose additional costs to trade with whale products. In April 2010 Greenpeace protestors blocked seven containers with whale meat in Rotterdam, Netherlands. The activists claim that since Netherland is a member to CITES and do not hold reservations to any of the great whales listed under Appendix 1, import in the country is illegal[46].

CONCLUSION ICELAND

With respect to regulations on whaling and trade with whale products the analysis shows that the existing policy and measures will not lead to depletion of the whale stock residing in territorial waters of Iceland. Also, if the research studies correctly estimate the size of North Atlantic minke and fin whales and their growth rate (and the results are not used in politically palatable manners) the Icelandic annual harvest will not endanger the species. However, if other than economical factors (such as political economy) are considered the whale hunt may lead to decrease in the whale stock. The negative international response and tourist boycott may undermine the benefits from the resumed commercial whaling.

NORWAY

A country with sound management and long-term interests in commercial whaling

A COUNTRY OVERVIEW

Norway is the 13th biggest producer of fish in the World with total landing of almost 2.4 million tonnes for 2007. The country is net exporter of fish products. In 2006 fish and

[46] Whaling Profitable but Bad for Iceland's Image, by Lowana Veal; REYKJAVIK, Apr 16, 2010 (Inter Press Services) ; http://www.ipsnews.net/

fish products export was estimated at USD 6,500 million while import was USD 700 million. OECD (2010) shows that seafood represented about 5% the total export of goods in 2007. In 2006 13,753 people were employed in the fishing industry which is hardly 0.3% of the population. As Japan and Iceland, Norway displays decrease in the number of fishers-from 23,395 in 1996 to 13,753 in 2006.

Around 95% of the landed fish is managed under Total Annual Catch (TAC) system. Norwegian fisheries are subject to licensing, annual permits and Individual Vessels Quotas (IVQ) which put constraints on the fishing efforts. In terms of GFTs, Norway makes direct payments, cost reducing transfers and general services which accounted for approx. 80% of the total transfer value in 2006 (OECD data). A minimum wage scheme provides fishermen with financial support when the income from fishing is insufficient, due to unfavorable environmental circumstances. Also, a transportation support scheme designed to reduce costs of bad geographical and structural conditions have to ensure uninterrupted supply to the processing industry. According to the theory from Part II these subsidies may lead to overexploitation of the fishing resources if applied incorrectly ("ugly" subsidies). The country has a decommissioning vessels scheme in place (a "good" subsidy). The total amount for the program was NOK 10 million (for both 2006 and 2007) and NOK 11.25 million for 2008, but was terminated in June 2008.

Whaling and sealing are traditional industries in Norway, the management of which is implemented under Ecosystem-based management approach (EBMA) as a major policy for marine resource utilization. Whaling is particularly important in small coastal fishing communities in the northern parts of the country where people rely on multispecies harvesting in order to compensate for the seasonal fluctuations in the fishing (Kalland, 1992). Whaling is conducted during few months in the summer thus filling the annual cycle in combination with herring, cod and capelin.

Domestic market

Norway resumed commercial whaling in 1993- five years after the whaling moratorium took place. The only species hunted industrially is minke whale. Approximately 80% of the whale meat and products are landed and sold via the Norwegian Fishermen's Sales Organization-Norges Råfisklaget. About 33 boats (with around 200 whalers[47]) were

[47] Norwegian Small-Type Whaling Association, pers. comm. 1992, cited by Mats Ris (1993) Conflicting Cultural Values: Whale Tourism in Northern Norway

engaged in whaling in the late 90s, declining to 24 in 2009[48]. The whaling income of these fishers is a small proportion of their total fishing revenue.

The catch is implemented under quotas which size fluctuated between 425 in 1996 to 885 animals in 2009 but the real take were around 30% less than the allocated quotas. Tinch and Phang (2009) suggest that the reasons for not fulfillment of the quotas might be low domestic demand as well as a number of restrictions imposed on whalers. Such constraints include seasonal limit of 15 tonnes of whale meat for vessels under 20 meters, confiscation of harvest if vessel's quota is exceeded etc. Also, because there is no market for blubber for human consumption it is a requirement mostly small-size animals to be targeted as they have more meat than blubber. Every whaling vessel and processing company is subject to special licensing. The processing factories have to be equipped with the necessary facilities to be able to store large amount of frozen products (TRAFFIC, 2001).

Consumption of whale meat was 0.25 kg per capita in 2000[49]. For comparison, the consumption of pork in the same year was 23.56 kg per capita. In terms of price competitiveness whale meat appears to be relatively expensive than other meat products. In 2009 a retailer price of whale meat cost NOK 172.50/kg[50] while a kilo of stewing beef was sold at an average price of NOK 168.93 and rump steak of port for NOK 148.09/kg[51]. However, Norges Råfisklag sets annually the minimum prices for whale meat which guarantee a selling price of NOK 30 (approx. USD 5.03). The organization sells the meat on behalf of the whalers through an immediate auction before the whale meat and blubber is landed.

Further evidences that domestic market for whale products is well developed in Norway is the fact that whale meat can be purchased from retailers, supermarkets or fish shops throughout the country as any other fishery products. "It is not considered as a special fishery commodity"[52]. Østlie (1999) reports that in 1997 and 1998 around 200g per capita was landed which is approximately 1% of the seafood consumption in Norway. A public opinion poll conducted in 2009 shows that 7% of Norwegians eat whale meat on a regular basis. Understandably, whale meat is more abundant in area whaler live- in

[48] Hvalfangsten godt I gang. 13 May 2009. www.kyst.no , cited in Tinch and Phang (2009)
[49] "Ostli, Jens. hvalkjøtt I den norske marked. Status og forslag til tiltak. Rapport nr. 16/1999. Fiskeriforskning
[50] http://www.isbilen.no/?id=56&title=hvalbiff 05/05/2009. The Isbilen company
[51] http://193.160.165.34/en/yearbook/tab/tab-254.html , Consumer price index, Statistics Norway
[52] Caroline Raymakers, (2001) Monitoring progress in Norway's development of a DNA register as part of its domestic management system for whale meat, investigating local whale meat trade, and investigating reports of illegal trade in blubberTRAFFIC Europe

northern part of the country and Lofoten Islands.

While, according to the theory, the existence of domestic market for the renewable resource suffering from open access is a shortcoming with respect to any measure correcting this externality (production tax, export tax and import tariff), it is not necessary the case with Norway. Indeed, there are number of regulations imposed on whaler, processor, wholesalers and retailers which guarantee that uncontrolled harvest and sell will not occur.

Control and monitoring

In the past 10 year, Norway has achieved considerable improvement in the control and monitoring of whaling and trade with whale products (TRAFFIC, 2001). Legislation has been enforced and special measures imposed on whalers and traders.

Since 1997 Norway has implemented a DNA register for all whales taken as a part of Norwegian annual catch. The aim of the registering is to help in monitoring of trade with whale products and make possible the distinction between legal and IUU sources. Every whale taken as by-catch is recorded too. Under Norwegian law, the discard of by-caught whales at sea is prohibited. They must be landed, sampled for DNA identification and could be processed for market sell afterward.

Every year the whaling vessels are inspected by an official engineering inspector. In addition, a government inspector (veterinarian) is appointed to each vessel at every operation. His role is to ensure that all the legal requirements are followed on board. The inspector keeps detailed records of each catch.

Also, every year before the start of the whaling season, the gunner of each whaling vessel has to attend a two days training course and pass a test on the use of the harpoon. The cost of the compulsory training is about USD300 per whaler and is paid entirely by the participant. This is additional constrain on the whaling efforts as well as a way to make the industry internalize the costs on marine resource management.

Furthermore, the legal means for whale hunting in Norway is a harpoon equipped with a grenade. The number of grenades is distributed per vessel depending on the whaling quota allocated to each vessel. The number, engraved on each grenade is recorded by a government agency. New model of grenades introduced in 2000 explodes only when the target is hit. This improvement decrease the number of grenades declared lost eliminating the risk of illegal hunting with these cartridges.

Regarding violation of the whaling law the penalties include a fine of up to NOK 1

million (USD 135,000) and imprisonment of up to one year. If a whale is caught in contravention of the law, an amount equivalent to the market value of the whale products can be seized from the fisher. Moreover, when lawful and unlawful catches are used together, the entire catch can be confiscated (TRAFFIC, 2001).

Scientific whaling

In the period of 1989- 1994 Norway carried out a scientific program aiming to estimate the size of the Northeast Atlantic minke whale stock and provide information on its role in marine ecosystem. The program included sightseeing surveys as well as lethal methods. In that period a total of 358 minke whales were taken. Based on the results of the research the Scientific Committee of IWC calculated the size of Northeast Atlantic minke whale stock[53]. From 1981 to 2004 three major studies were conducted with the goal to assess and improve the killing method and hunter's safety during operations. The research resulted in development of new weapons, obligatory education and training of harpooners and inspectors and improved animal welfare associated with the hunt[54]. All these measures suggest for strict industry regulation and sound management of the whales resources.

Commercial whaling

As Norway has lodged objections to items in the ICRW Schedule regarding industrial whaling, it has the legal right to set national catch limits for its coastal whaling operations. The country resumed commercial whaling in 1993 on two stocks if minke whales- the Northeast Atlantic stock which, according to IWC statistics, number 112,000 whales and North Atlantic Central stock with total population of 72,000 animals. The annual catch quota is set by the Government, based on scientific criteria and recommendations of the Scientific Committee of IWC. The quota for the first year was 319 whales and since then it raised more than three times reaching 1052 individuals in 2007. However, since hunt resumption a full quota has never been met (see Table 10 in Appendix II for number of catch and total production for the period 1982-2007).

Ris (1993) reports that ownership of the whaling vessels is family based: usually two brothers with sons own the boats. As whalers are in fact fishermen by definition, whale catch is only a part of the fishing income. It is smaller than those from fisheries but

[53] http://www.norway.org/aboutnorway/economy/trade/marine/whaling/
[54] Egil Ole Øen (2006) Norwegian minke whaling . Research to improve hunting and killing methods for minke whales in Norway

relatively more stable. Whaling is most vital to some small and isolated communities in Lofoten, such as Reine and Skrova. About 20% to 40% of the workforce is directly involved in whaling in these areas (Mjzfonesland *et al.*, 1990).

For the governmental efforts to regulate access to and strengthen the property rights over whales speaks the fact that Norwegian whalers operate only in waters under Norwegian jurisdiction- 200 nautical mile of Exclusive Economical Zone. The areas where whaling is allowed are divided into five sub-areas and annual quotas are assigned for each of them. A limited number of vessels are allowed on each of these zones. The sum of licenses issued every year is decreasing: from 381 in 1938 and 91 in 1979[55] to 24 in 2009. If a vessel is caught to hunt without the necessary permission it is subjected to strict sanctions. Considering the economic theory, vessel licensing and quota system are strong evidences for pro-conservation policies. On one hand, licensing of each whaling vessel restricts the open access to the whale stocks and assigns the property rights only to those which possess permission. On the other hand, harvesting under quota set an upper limit to the number of whales which can be taken therefore restricting the whaling efforts. As IUU catch is severally punished all these measures guarantees that even if free trade is opened up (i.e. transfer of given whale stocks from Appendix I to Appendix II of CITES), this will not result in depletion of the whale stocks object of Norwegian commercial whaling.

Subsidies to whaling

Tinch and Phang (2009) report that major part of the governmental subsidies to whaling is allocated for research fund, DNA register, Norges Råfisklaget budget support associated with whaling, costs associated with IWC membership, marine mammal management expenditures. In 2004 USD 400,000 were devoted to Fishery and Aquaculture Research Fund (FARF) which has to create new opportunities for the sealing and whaling industries. The goals of a FHF research project from 2009 were “realizing seal and whale blubber’s commercial potential" and "increasing the value of whales as a primary product"[56]. However, because of its high toxic contamination hundred ton of blubber had to be disposed. Norway keeps a DNA register for all minke whales captured since 1997. The expenses on this register in the period 2001-2007 were

[55] Anderson, R.M. et. al. (1987). The State of the Northeast Atlantic Minke Whale Stock. Report of the Group of Scientists appointed by the Norwegian Government to review the basis for Norway's harvesting of minke whales. Published by Økoforsk.

[56] Project details from FHF project data base at http://www.fiskerifond.no/index.php?current_page=prosjekter on dates 04.04.2009-16.04.2009. , cited by Tinch and Phang (2009)

almost USD 1.3 million. Several whaling companies receive investment grant in order to improve their whale-connected business. Lofothval Company and Gunnar Klo received in 2007 USD 11,250 and USD 27,000 respectively and Asbjørn Selsbane AS company USD 19,000 in 2003, for improving the distribution of whale meat. Pursuant to the theory recounted in Part II, these direct transfers to the whaling companies represent cost reducing payment which decrease the fishing efforts and thus stimulate the intensive harvest of the resource. Additionally, Råfisklaget – the Norwegian Fishermen's Sale Organization subsidized number of projects for activities which promoted whale meat consumption. Between 1992 and 2008 USD 2.9 million were spent for activities popularizing the Norwegian marine mammal management abroad[57]. The funds were also used for lobbing for the Norwegian position on whaling at CITES meetings. Although such policies are consistent with the official governmental position of increasing the market for whale products, if not conducted properly, they may have adverse impact on North Atlantic minke whales stocks as they potentially may lead to overexploitation of the resources.

Nevertheless, the domestic market for whale blubber is rather limited the potential of export markets could prove the commercial viability of Norwegian whaling. In this respect, Norway's long-term ambition to resume industrial whale hunt is apparent from the fact the government subsidized the production and storage of whale blubber at rate of up to NOK 3 (USD 0.4)/kg. The upper limit of the government transfer was NOK 1.5 million (USD 185,000) in 1997 and was raised to NOK 3 million (USD 365,000) in 1999 (TRAFFIC, 2001).

A regulation from 1993 required every whaling vessel to be inspected by veterinarian. The costs of this monitoring program were fully covered by governmental subsidies. In 2007 this practice was replaced with an electronic logbook system. The cost of installation and operation were born by the owners of whaling vessels[58].

All these subsidies are in line with the official government agenda for development of the whaling and whale based industries. Construe in the postulations of theory presented in Part I, they should have a negative impact on the whale stock and potentially lead to reduction of the resource. However, this is not the case of Norway. The reason is strict control and monitoring over the harvest, domestic market and trade as well as good

[57] St. meld. nr.27 (2003-2004), op.cit.; Stortinget sporsmal 8, Jan Simonsen/Statsrad Svein Ludvigsen, 1 December 2004; St. prp. 2007-2008 and 2008-2009. "divers fiskerformal", vited by Tinch and Phang (2009)
[58] Forskrift om bruk av ferdskriver for elektronisk overvåking av fangst av hval. (FKD)

management of marine living resources.

Whale-watching tourism

The development of whale-watching tourism in traditional whaling regions in Norway follows the international trends from 1980s for non-consumptive utilization of whales (Ris, 1993). The industry is concentrated in the northern parts of the country- areas where whalers and processing companies are situated too. In 1991 there was only one operator offering whale-watching trips with total number 4,563 tourist for the same year[59]. Seventeen years later (in 2008), the number whale-watching tourists have grown to 35,360 with 20 operators offering the service (see Table 11 in Appendix II). The tourists are predominantly international, accounting for 85% of the total visitors. Whale-watching business is particularly important for the region of Andenes with population of only 2,900 people and total of 16,300 whale-watchers (2008). Most of the crew on whale-watching boats is also whalers with the necessary experience and skill for finding whales. The coexistence of whaling and whale-watching industries is possible because tourist operators target sperm, humpback and minke whales (as well as dolphin, porpoises and other small whales), while whalers hunt only minke whales. However, the transition from whaling to whale-watching business does not seem to be so easy. In an interview local tour-operator states that he had to invest around $160 000 in order to meet safety regulations for taking passengers on board and heavily indebted at the beginning of 1990s (International Study Group on Norwegian Small-Type Whaling, 1992).

Nevertheless, if the moratorium on commercial whaling is prolonged the growing whale-watching tourism will provide former whalers with new source of income using their knowledge and skills. On the other hand, if commercial hunting of minke whales is allowed, it is unlikely to harm the tourist operators, as it will not increase their costs associated with longer trips to spot a whale. Instead, the whale-watching interest will shift to other species which are relatively more abundant and are not industrially hunted. It remains unclear what will be the possible cost of tourists who cancel their holiday trips to Norway as protest to lifting the ban on commercial whaling.

EXTERNAL TRADE WITH WHALES PRODUCTS

Norway, as Japan and Iceland took reservations to CITES Appendix I on several whale

[59] Source: Whale Watching Worldwide: Tourism numbers, expenditures and economic benefits, © 2009 A special report from the International Fund for Animal Welfare (IFAW)

species, enabling the countries to trade with each other as well as states which are not parties to CITES (such as Faroe Islands). Japan, Iceland and Faroe Islands are traditional trading partners of Norway for products with cetacean origin.

According to Japanese Customs Statistics, in the period of 1980-1986 a total of 3,970 tonnes of whale products (both blubber and meat) were imported in Japan from Norway. The trade with Japan and other countries is rather sporadic (see Table 12 in Appendix II). In 2002 Norway resumed export of whale meat and blubber to Iceland. Two deliveries of meat 7,634 kg (worth USD 59,000) and 16,971 kg (USD 65,000) were shipped. Concern over the toxic level of whale products as well as Iceland's resumption of whaling, prevented the countries from further trade (Tinch and Phang, 2009). Norway also made several shipments to Faroe Islands. In 2003 the country shipped 8,345 kg whale meat at the value of US$66,500. Followed only small deliveries with weight less than 2,000kg. Norway, Iceland and Faroe Islands have free trade agreements under European Free Trade Association (EFTA).

Norway's import in this category is insignificant- in 1999 the country imported two shipments of frozen edible offal from marine mammals with weight 26,804kg and 84,731kg. Last import in the same category was made in 2000 of a 26,979kg shipment.

Due to the fact that sealing and whaling are traditional industries, Norway is a major exporter of marine mammals' oil. In 2009 the country exported to the World 117 tonnes of oil worth USD 702,000 (International Trade Center statistics). Except Chinese Taipei and Iceland (0 tariff rate), Norway faced import tariffs ranging from 3% (Republic of Korea) up to 50% (China) on the foreign markets.

Export of whale products is subject to numbers of specific conditions. Export licenses are granted to countries which issue import licenses and execute DNA testing of the imported whale products. This makes possible traceability of individual minke whales taken as a part of Norwegian quota. Import licensing and DNA registering are non-tariff barriers, which according to the theory discussed in Part II, act as conservation measures for the natural resources. This is because they impose additional costs, therefore raise the price of the product and constrict the demand in the foreign market. They make the trade more transparent as they require the trading partners to publish information about the products and also notification to WTO.

CONCLUSION NORWAY

Strong regulatory and control regime over whale hunting and trade with whale products

in Norway suggests that the country will not deplete its renewable natural resources if free trade is opened up. These policies and measures may come as a result of strong international pressure for control of the industry but are also evidences for the country's long-term interests in whaling. The fact that both the whaling and whale-watching industries are well developed means that whatever future decision on resumption of commercial whaling is taken in IWC, Norway will be able to utilize the existing endowment with cetacean resources.

UNITED STATES OF AMERICA

a country symbol of environmental movements or cultural hegemony

A COUNTRY OVERVIEW

United States is the forth biggest producer of fish and fish products in the world. Commercial landing amounted close to 4.7 million tonnes in 2007 which is approximately 6% of the global fish capture (see Figure 4, Appendix II). According to FAO statistics the country is the largest importer of fisheries products accounting for 15% of the world import for 2007. The same year it imported 13,631,511 tonnes and exported 4,436,746 tonnes in the same category.

The official U.S. government strategy regarding the management of marine resources is summarized in Magnuson-Stevens Fishery Conservation and Management Act from 2007. The Act provides an updated framework for addressing such areas as overfishing, IUU fishing, by-catch, the increased role of science in the resource management etc. (OECD, 2010).

Although USA sustains one of the most developed fishing industry in the World is not currently a whaling country. Derr (1997) report that United Stated is the most prominent anti-whaling supporter from the countries in the Western World.

The anti-whaling movement and cultural imperialism

Why the anti-whaling movement started in the Western World and what were the motives of the governments to support it? Kalland (1993) gives a very pragmatic explanation of the phenomenon. First, most of the non-profit organizations are founded in countries where whaling is of marginal or no importance for the national economy. This makes the potential proponents relatively isolated from the negative effect of the campaigns. Second, environmentalists and animal rights activists know that the totemic

image of "supper whale" bring money and supporters which is important for the organizations to acts as pressure groups. Moreover, the whaling issue is an ideal way for governments and polluting industries to build a "green image" as it is inexpensive and always "safe" to support the crowd. They do not have to bear the negative impact of complains. The targets of the campaigns are small fisheries communities which are unable to fight back and influence political decisions in their favor.

Moreover, when ICRW was created initially it was not environmental treaty but international agreement to regulate whaling and stabilize the prices of whale oil. Over the years many non-whaling countries has joined the Commission thus transforming it into a "preservationist club". Osherenko (2005) writes that the moratorium from 1986 follows the pattern of domination in which hegemonic countries try to impose their values, cultures (including culinary preferences) and standards on "less powerful as well as racially, culturally, and ethnically different nations".

Aboriginal subsistence whaling

Part I illustrated what are the differences between aboriginal and commercial whaling. Gambell (1997) reminds: "Aboriginal subsistence whaling means whaling for purposes of local aboriginal consumption carried out by or on behalf of indigenous peoples who share strong community, familial, social and cultural ties related to a continuing traditional dependence on whaling and on the use of whales".

While U.S. does not hunt whales on a commercial scale it does recognize the needs of Makah Intuits- the most distant northwest living population of Alaska, to take the endangered species. The rights of whaling of Makah community are secured by the Treaty of Neah Bay from 1855, when the community relinquishes its territories to United States. However, Makah large-scale whaling was halted in 1920s when grey whales were declared protected. Since the beginning of the moratorium U.S. took under aboriginal subsistence quota 1,120 bowhead, 9 grey and 2 minke whales (see Table 2, AppendixI). Each whale provides meat and blubber, which are shared between all the people in the community[60].

Renker (2007) reports that the benefits from whaling are important for the Makah natives owing to the facts that unemployment amongst the indigenous population is traditionally high and harvest of other fishery stock is unstable (due to federal regulation and quota restrictions). In this sense, whales hunt is a significant source to offset the

[60] Alaska Eskimo Whaling Commission- http://www.alaska-aewc.com/aboutus.asp

diminishing reliability of marine fishery, environmental groups' pressure, industrialization and other factors beyond the control of locals. In addition to the economic and nutrition value, whales have social importance for Makah. They fear that social and psychological degradation will result if they are prohibited whaling.

Control and monitoring of aboriginal substance whaling

The Alaska's whale catch is managed by the Alaska Eskimo Whaling Commission (AEWC) which reports to the National Oceanic and Atmospheric Administration (NOAA) of United States Department of Commerce. NOAA is a primary responsible for management and enforcement of programs concerning bowhead whales. AEWC is a tax-exempt non-profit corporation which members are registered captains and their crews from ten whaling villages. The state of Alaska has no authority to regulate Eskimo subsistence whaling. This power is vested in the federal government under the Whaling Act of 1949, the Marine Mammal Protection Act (MMPA). Federal authority for local management and regulation of aboriginal whaling is then delegated to AEWC through cooperative agreement with NOAA. The purpose of this agreement is to protect the bowhead whale and Eskimo culture and promote scientific research of the bowhead whale[61].

NOAA representatives monitor the catch and collect information regarding number, length, sex and alike, for the taken species. AEWC and NOAA determine the total number of bowhead whales that can be caught each year through annual negotiations during the first quarter of the year for which the quota is applicable. According to the Whaling Act, each person or entity has to obtain a whaling license for each whaling vessel, whaling station or other plant used in the processing of whales and other craft engaged in taking of whales. The license is obtained against payment of annual fees. Registered captains are subject to civil monetary assessments for whales struck over annual strike permit and whales landed over any landing limit. It is unlawful to kill calves or female whales accompanied by calves. All above shows that aboriginal whaling is under strict surveillance from the authority. Remember the theory from Part II which explains that control and monitoring of the access to the resources is the major guarantee against overexploitation and species' extinction.

[61] Cooperative Agreement between the National Oceanic and Atmospheric Administration and the Alaska Eskimo Whaling Commission as amended 2008

PART III

Domestic policies, trade, external relations

The United States plays a significant role in the global conservation of endangered species, and in particular, in the imposition of moratorium on commercial whaling owing to its domestic laws.

The country incorporated the IWC's régime into its domestic law in 1971 through the Pelly Amendment to the Fisherman's Protective Act from 1967. The Amendment constitutes that "the Secretary of Commerce, upon determination that foreign nationals are conduction fishing operations, [trade or taking] in a manner which diminishes the effectiveness of international fishery conservation programs", any international program for endangered or threatened species, to certify this fact to the President (Saundry, 2008). The President is then authorized, at his discretion, to prohibit import of any product[62] from these countries. There are several U.S. environmental laws linked to the Pelly Amendment under which foreign policies or production practices are "deemed" certification (Charnovitz, 1994). The Marine Mammal Protection Act 1972 prohibits the hunting and killing of marine mammals and ratifies the appliance of a moratorium on the import, export, and sale of marine mammals' products. Under Packwood-Magnuson Amendment from 1979 to the Fishery Conservation and Management Act of 1976, if the Secretary of Commerce discovers that a country is "engaged in trade or taking" which diminishes the effectiveness of the International Convention For Regulation of Whaling, it is deemed Pelly certification.

Although U.S. trade embargo has never been imposed on a whaling nation, there are a number of cases where the threat of application deterred foreign countries from action endangering whales. In 1974, for instance, under the pressure of United States, Japan and Soviet Union has complied with the annual whale catch quota[63]. In 1978 Chile, South Korea and Peru were accepted to the IWC under threat of certification under the Amendment.

Conversely, critics of the Amendments argue that, irrespective of whether a country's whaling is consistent with the ICRW, it may face trade sanctions to any of its products entering the United States. Moreover, the international concern is that through unilateral judgment America is trying to impose its own environmental standards and cultural inclinations to the rest of the world (McDorman, 1997).

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[62] Initial text of the treaty limits the import ban only to fishing products from the breaching country. From 1992 the import restriction is extended to any product thus increasing the threat power of the Pelly Amendment

[63] "Not Saving the Whales: President Ford Refuses to Ban Fish Imports from Nations Which Have Violated International Whaling Quotas", 5 Environmental Law Report 10,044-47 (1975).

PART III

Is the existence of the Pelly Amendment and trade embargos imposed under the Pelly Amendment consistent with the General Agreement on Tariffs and Trade (GATT) principles? As was already explained in Part II, application of trade sanctions will be legal under GATT only if its explicit purpose is to protect a state's domestic environment or as a countermeasure to foreign policy and actions which breach international conservation treaty. Under second criteria U.S. Pelly Amendment qualifies for application of trade sanctions. However, as whales are no one property, the motive of environmental protection is questionable. The circumstances of each case has to be investigated individually so as the legitimacy of trade sanction to be determined.

The case of Japan

In 2001 United States threatened to deny Japan future access to fishing rights in U.S. waters for including sperm and Bryde's whales in its scientific whaling program[64]. Although the stocks of these species do not resides permanently in U.S. waters (hence do not qualify for a measure aiming to protect domestic environment), the increase in the Japanese whaling quota may diminish the effectiveness of ICRW. Both countries are members of IWC and therefore this will be consistent with the GATT condition for legitimacy (see Part II) for application of trade sanctions as countermeasures against a breach of international treaty. Nonetheless, despite "deeply concerned" the US president then Bill Clinton decided not to impose trade sanctions against Japan.

The case of Iceland

Iceland is no longer a party to the International Convention for Regulation of Whaling and its decision to resume commercial whaling in 2006 is, therefore, not a breach of the treaty. Even so, in 2004 Commerce Secretary then Donald Evans certified Iceland for undermining the effectiveness of the convention through its scientific whaling. Minke and fin whales are protected under the U.S. Marine Mammal Protection Act which gave the Commerce Secretary a legal basis for enforcement of the Pelly Amendment. Moreover, Iceland is a party to CITES and its export of minke whale meat may serve as a legal ground for future trade embargos by Unite States. The situation becomes complicated from the fact that minke whales are listed in Appendix I of CITES but

[64] Us Will Not Impose Trade Sanctions On Japan; current headlines 08.01.2001 and Japan Whales, The Us Wails, current headlines 14.09.2000, High North Alliance;

Iceland holds reservations on several stocks which are of its commercial interest. McDorman (1997) writes that if U.S. decides to impose embargo on whale products from Iceland, adhering to its CITES obligations, it is quite possible the WTO dispute settlement panel to decide that the embargo is GATT-consistent. If, however, the U.S. embargo is against non-whale Icelandic products the technical law is in favor of Iceland, although the WTO settlement panel might be hesitant to undermine CITES. Although the certification reminded active, the president did not impose import embargo on Icelandic products.

The case of Norway

Norway has been certified by United States on a number of occasions. In 1982 Norway lodged objections to the IWC moratorium and continued whaling activities. In 1986 the country was certified by United States for diminishing the effectiveness of the Convention. Even though Norway has objected the ban and was therefore not bound to it, the country suspended commercial whaling in 1987. In 1992 and 1993 the Secretary of Commerce again certified Norway, but imposition of trade embargo against Norwegian products did not followed. Although Norway is a member of IWC its choice to utilize the provision of the Whaling Treaty to "opt out" from the moratorium makes commercial whaling legal under ICRW. Norway also trade with whale products holding reservations to Appendix I of CITES. The legitimacy of a possible U.S. embargo will depend mostly on CITES and how WTO dispute resolution body will accommodate its principles.

Besides the Pelly Amendment, the pro-conservation political line in United States is manifested through numerous statutes enforced in the country. There are several acts with explicit impact on whales:

The Marine Mammal Protection Act of 1972 prohibits "the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S.".

Under the Endangered Species Act of 1973 all federal agencies are prohibited from authorization, funding or caring out any activity that could jeopardize the listed species or modify their habitat. The act forbids "unauthorized taking, possession, sale, and transport of endangered species".

In 1972 the United States enacted the Marine Protection, Research and Sanctuaries Act

which established the National Marine Sanctuaries System. The system consists of 14 marine protected areas covering territory of more than 150,000 square miles (390,000 km2). The sanctuaries are administered by NOAA. The primary objective of the sanctuaries is to provide a save habitat for endangered species and "protect historically significant shipwrecks and artifacts". They also provide education and scientific research services, recreation sport and indirectly support tourism.

Whale-watching tourism

With nearly 5 million whale-watching tourists annually and total expenditure of USD 1 billion, United States sustains the largest whale-watching industry in the world (O'Connor et al., 2009). The historical record shows that the first commercially-organized whale-watching trips in U.S. were offered in St. Lawrence River, North America back in 1971[65]. Today the industry is developed in more than 90 communities in 8 states of the United States. While most of the tourists are domestic, the percentage of international tourists varies from 10% for the state of Washington to 50% for California (Hoyt, 2001).See Figure 13, Appendix II for total expenditures for 1991-2008.

Utech (2000) studies what is the economic impact of whale-watching on regional development in the case of Hawaii. He finds that whale watching is an essential component of the islands' ocean recreation industry. The total economic impact of whale watching (including direct and indirect revenues) in 1999 was approximately USD 19-27 million. The industry supported the equivalent[66] of 280-390 full-time jobs in Hawaii. For comparison, the total direct and indirect revenue of Hawaii's ocean boat industry amounted of USD 225 million in 1999, supporting around 3,200 jobs.

Considering the increasing importance of whale-watching tourism in United States and the political line for conservation of marine living resource it is logical that the country would be strongly against the resumption of commercial whaling of foreign countries. Thus, besides the ecological and ethical reasons behind the official political position for non-consumptive utilization of whales there might well be economic motives, articulated in the U.S. anti-whaling position.

[65] Whale watching, Wikipedia-http://en.wikipedia.org/wiki/Whale_watching
[66] The jobs estimates are generated by using a multiplier from the 1992 Hawaii State Input-Output Model in combination with this study's estimates of 1999 whale watching direct revenues (Utech,)

PART III

CONCLUSION UNITED STATES OF AMERICA

From all the states above it becomes clear that U.S. is a country that oppose the lethal utilization of cetacean natural resources and adopt domestic policies and trade measures promoting their conservation. Entering into the role of the "good guy"- preservationist is relatively easy against the "bad guys"- whaling countries, recalling the "days when large pelagic fleets hunted some large cetaceans almost to extinction in the search of whale oil". However, the anti-whaling stance of America may be based on rather political and economic than pure ecological rationales.

CONCLUSION OF THE THESIS

This master thesis came as a response to the today's heated debates over the utilization of great whales as resources and the value different cultures attach to them. Relevant to many endangered species, the polemic over lethal consumption of the living resources or their non-lethal (and non-consumptive) utilization raises the question of what are the factors which leads to their extinction. Applying the assumptions for countries' specialization and gains from trade based on factor endowments which underlie Hechsher- Ohlin theory, the thesis shows that the first assumption still holds when applied to highly migratory cetacean species. However, when trade is opened up for resources suffering from "tragedy of common" externality the classical assumption for gain from free trade do not hold. As already explained the reasons are uncontrolled access and harvest of whales and impossibility of a nation to internalize the conservation effort she will make over the common resource.

Taking Iceland as an example further confirms the fact that free trade can exacerbate the harvest of renewable resources. The country has limited prospects for growth in the local market, therefore not the resumption of commercial whaling but the permission of trade will determine the exploitation path. Yet the thesis shows that owing to international agreements such as ICRW and CITES and numbers of domestic and trade regulations the depletion resulting from trade is preventable.

In this respect if , following the example of Kyoto Protocol to the United Nations Framework Convention on Climate Changes from 1997, the property rights over whales stocks are assigned to either whaling or non-whaling nations, and they have the

opportunity to trade these rights it will make feasible sustainable harvest and stabilization of the cetacean population. In this case, people can trade their rights to kill whales (or generate externalities) in the same way as they trade the rights to produce and possess ordinary goods. They will also have the incentive to preserve the resources owing to their ownership interests.

Furthermore, Professor Clevo Wislon from Queensland University of Technology, Australia said: "... if the countries for whom whales are worth more alive than dead charged a small levy of say five dollars (4.6 U.S. dollars) per whale-watching tourist, whale-watching countries could compensate those for whom a dead whale is worth more than a live one".

Humans are dependent on the natural endowments living on the Earth, therefore their use should be outcome of wisdom management rather emotional and political objects.

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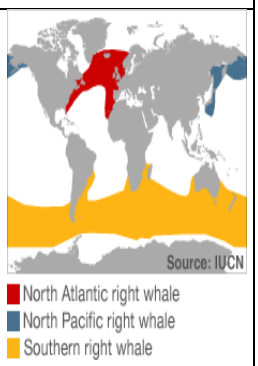
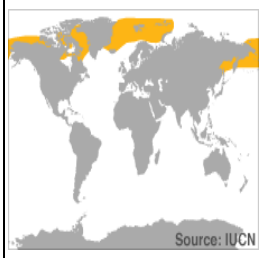
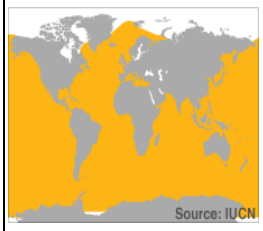
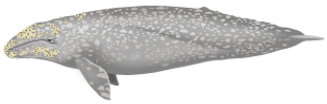
APPENDIXES

APPENDIX I: Tables and figures related to Part I

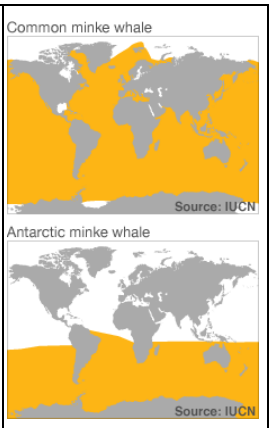
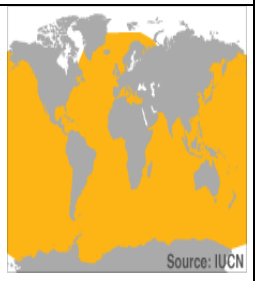
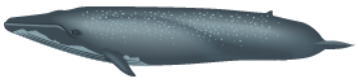
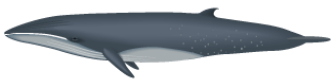
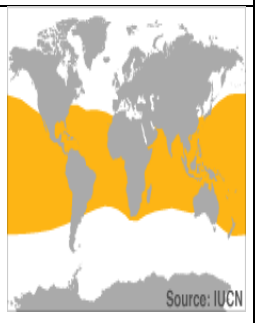
APPENDIX II: Tables and figures related to Part III

APPENDIX I

Table 1. Estimated population, conservation status and range of great whales

SPECIE	POPULATION ESTIMATES (IWC) approx.	CONSERVATION STATUS*	RANGE
Right whale *(Eubalaena australis) 13.5 - 18m length; 40- 80 tones weight* 	*300 in Western North Atlantic (2001); 7 500 in Southern Hemisphere (1997)*	*endangered- North Atlantic and North Pacific; least concern- Southern right whale; protected since 1930s*	
Bowhead whale *(Balaena mysticetus)- 14-15m length; 50-60 tones weight* 	*10 500- Bering-Chukchi- Beaufort Seas stock (2001)*	*least concern*	
Fin whale *(Balaenoptera physalus) 19-22.3m length; 45-75 tons weight* 	*30 000- North Atlantic (Central & Northeastern) (1996-2001); 3 200- West Greenland (2005)*	*Endangered; protected since 1976*	
Grey whale *(Eschrichtius robustus)- 13-14.1m length; 14-35 tones weigh* 	*26 300- Eastern North Pacific (1997-1998) 121- Western North Pacific (2007)*	*Least concern;*	
Humpback whale *(Megaptera novaeangliae) 12-14m length; 25-30tones weight* 	*11 600- Western North Atlantic (1992-1993); 42 000- Southern Hemisphere south (1997-1998) 10 000- North Pacific (2007)*	*Least concern; protected since the mid-1960s*	

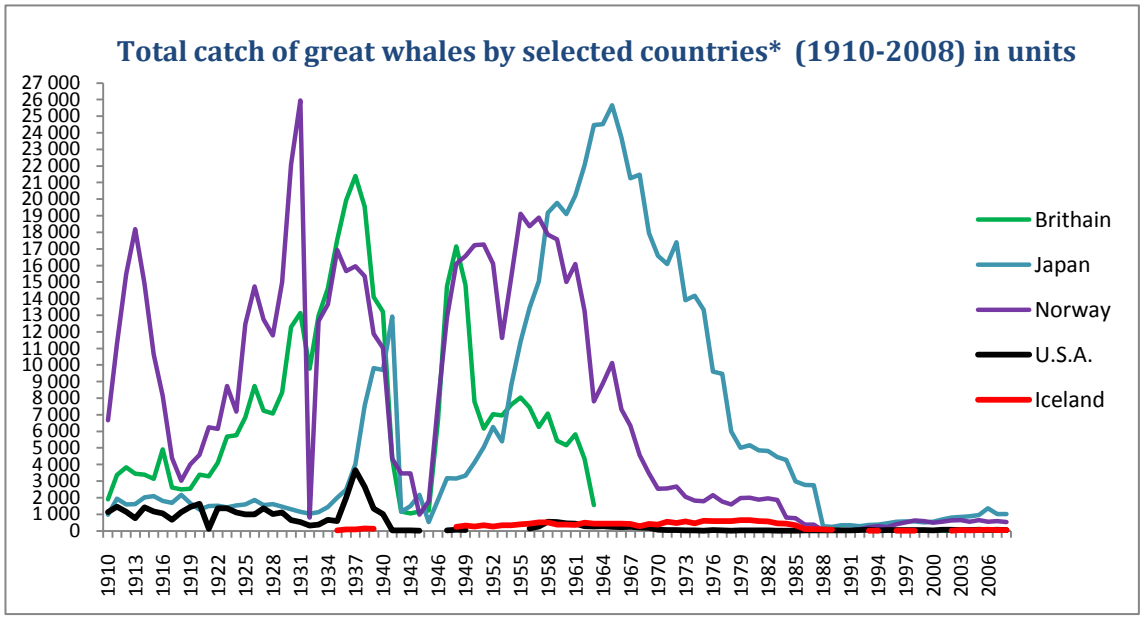
APPENDIX I

Mink whale *(Balaenoptera acutorostrata)* *8-10m length;* *9 tones weight* 	*761 000- Southern Hemisphere (1982-1989)* *174 000- North Atlantic (1996-2001)* *10 800- West Greenland (2005)* *25 000- North West Pacific and Okhotsk Sea (1989-1990)*	*Least concern (common mink whale);* *data deficient (Atlantic mink whale);*	
Sperm whale *(Physeter catodon)-* *11-15m length; 20-45 tones weight* 	*** 360,000-1 million*	*Vulnerable;* *Protected since 1982*	
Sei whale *(Balaenoptera borealis)- 13.6.-16m length;* *20-25 tones weight* 	***10 500- North Atlantic (1989)* *9 000-28 000- North Pacific (1989)*	*Endangered; protected since the 1970s in the Antarctic and North Pacific, and since 1982 in the North Atlantic*	
Blue whale *(Balaenoptera musculus)* *25-26,2m length;* *100-120 tones weight* 	*2 300- Southern Hemisphere (1997-1998)*	*Endangered; protected since the mid-1960s*	
Bryde's whale *(Balaenoptera edeni)* *13,7-14,5m length;*  *16-18,5 tones weight*	*20 501- Western North Pacific (1998-2002)*	*Data deficient*	

Source: BBC news; www.bbc.co.uk/news/10340277

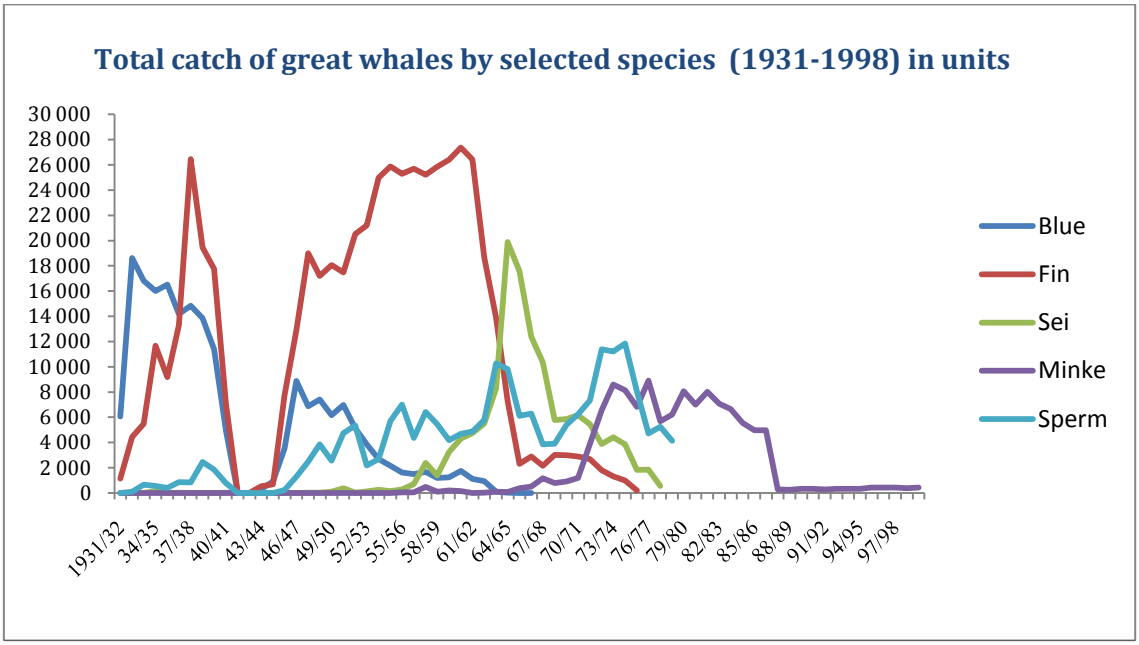
APPENDIX I

Figure 1. Total catch of great whales by selected countries in 20th century



Source: FAO data
**the figures present the major catching countries for that period*

Figure 2. Total catch of great whales by selected species in 20th century



Source: Whaling Statistics; www.luna.pos.to/whale/sta.html

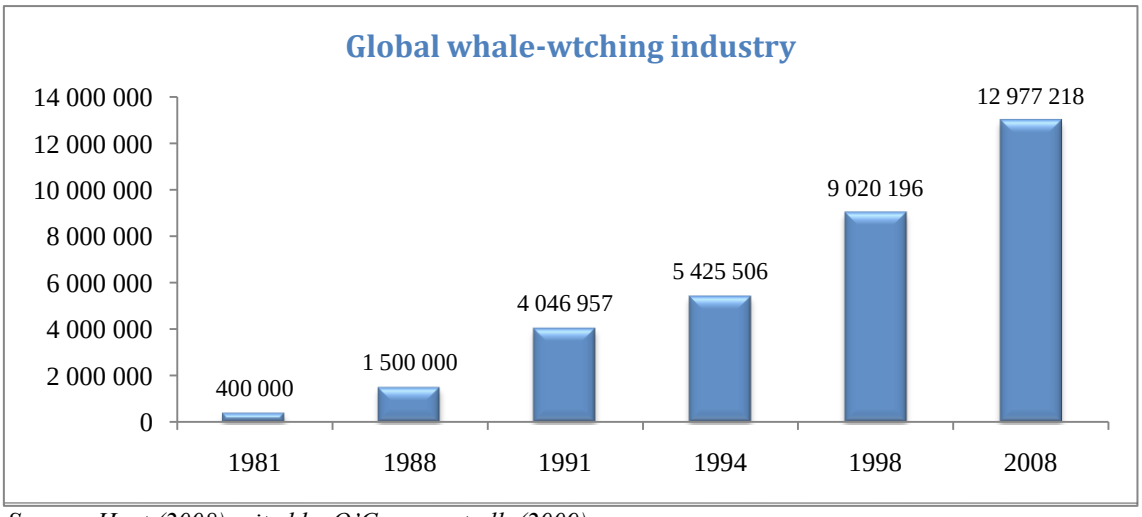
APPENDIX I

Table 2. Whales taken under objection, scientific permit or aboriginal subsistence

status	species	Iceland	Japan	Norway	U.S.S.R.	Denmark/ Greenland	USA
Period		**86/07**	**88/09**	**93/94**			
scientific	Fin	292	14	0	0	0	0
scientific	Sperm	0	47	0	0	0	0
scientific	Sei	70	592	0	0	0	0
scientific	Brydes	0	446	0	0	0	0
scientific	Minke	200	11294	289	0	0	0
TOTAL		562	12393	289	0	0	0
Period				**85/08**	**85/08**	**85/08**	
aboriginal	Fin	0	0	0	0	309	0
aboriginal	Sperm	0	0	0	0	0	0
aboriginal	Sei	0	0	0	0	3	0
aboriginal	Bryde	0	0	0	0	0	0
aboriginal	Mink	0	0	0	3	3602	2
aboriginal	Grey	0	0	0	2776	0	9
aboriginal	Bowhead	0	0	0	15	0	1120
aboriginal	Hampback	0	0	0	0	20	0
TOTAL					2794	3934	1131
Period		**06/09**	**86/88**	**86/09**	**85/87**		
objection	Sperm	0	388	0	0	0	0
objection	Fin	7	0	0	0	0	0
objection	Brydes	0	634	0	0	0	0
objection	Minke	45	4497	8621	6056	0	0
TOTAL		52	5519	8621	6056		

Source: IWC statistics

Figure 3. Growth in the global whale-watching industry since 1981 in number of tourists



Source: Hoyt (2008); cited by O'Connor at all. (2009)

APPENDIX I

Table 3. Whale products and their substitutes

Whale products	Product Derived from	Processing	Alternative Products
Umbrellas	Baleen	Cut, Carved	Spring Steel
Brooms and Brushes	Baleen	Cut, Carved	Spring Steel
Corset Stays	Baleen	Cut, Carved	Spring Steel
Fertilizer	Bone	Grinding	Seaweed, Various Organic and Composted Materials
Medicines and Pharmaceuticals	Spermaceti	Refining and Filtering	Domestic Animal Sources
Floor Coverings	Sperm Oil, Whale Oil	Polymerization	Linseed Oil, Jojoba Oil
Oil Dressing for Animal Hides Preparation	Sperm Oil	Sulphurized	Acids from Plant Materials
Cold Creams, Lipstick, Shaving Cream, Hair Oil, Ointments	Sperm Oil, Blubber	Saponification	Lemon, Orange, Jojoba Oils, Cactus Cream, Avocado, Cucumbers
Gelatine	Skin, Bones, Tendons	Boiling	Skin, Bones, Tendons, and Hooves of Domestic Cattle
Lubricating Oil	Sperm Oil	Hydrolization	Linseed Oil, Caster Bean Oil, Tung Oil, Rapeseed Oil, Jojoba
Textile Finishing	Sperm Oil	Sulphurization	Linseed Oil, Caster Bean Oil, Tung Oil, Rapeseed Oil, Jojoba
Blending Agent for Printing Inks	Whale Oil	Polymerized	Plant Extracts and Chemicals
Plaster Bases for Carbon Papers and Stencils	Sperm Oil, Whale Oil	Sulphurization, Polymerization	Jojoba Oil, Rapeseed Oil
Margarine, Lard, Shortening	Whale Oil	Hydrogenation	Vegetable oils, (Soya, Sesame, Corn, Safflower)
Carvings and Souvenirs	Whale Teeth, Baleen	Cut, Polished, Carved	Synthetic Materials, Postcards, Photographs, Recordings and Tapes, Carvings on Ivory Nut, Domestic Animal Bone
Vitamin A	Whale Liver	Extracted	Carotenes from Carrots, Alfalfa, Cod Liver Oil
Animal Feed	Whalemeat	Ground and dried	Residual Seed Meal of Jojoba, Sugarbeets, Seaweed, other Grains, and Domestic Animals
Candles	Whale Oil, Sperm Oil,	Hydrogenation	Beeswax, Paraffin, Jojoba, Tallow
Crayons and Pencils	Whale Oil, Sperm Oil,	Hydrogenation	Jojoba
Perfume	Ambergris (intestine of the sperm whale)	None	"Fixateur 404" and others based on Oak Moss, Clary Sage, Labadanum, Agar, Wood Oils, etc.
Suntan Oils	Whale Oil	Cetyl Alcohol derived from saponification	Jojoba Oil, other Oils
Transmission Fluid	Sperm Oil	Refining	Jojoba, Rapeseed
Soap	Whale Oil	Saponification	Jojoba, Palm Oil, and others

Sources: Plano ISD; http://k-12.pisd.edu/cyberweb/science/Whale_Products.htm

APPENDIX I

Explanation notes- description of some terms used throughout the thesis

whale stock- animals from the same species separated into distinct groups in different breeding grounds.

whale oil- a mixture of wax esters and triglycerides. It is a product derived from rendering the blubber of baleen whales. At the peak of commercial whaling in 18-19th centuries, it was a major source of raw material for the manufacture of different commodities such as soaps, margarine, lighting and machine lubricant. Because of the last use, it was commonly referred as "train oil" (Ellis, 2002).

spermaceti- spermaceti oil is a liquid in the head cavities of sperm whale, which when exposed to air turns into wax. Spermaceti is extracted from sperm oil by crystallisation at 6 °C, when treated by pressure and a chemical solution of caustic alkali (Wikipedia). It is not edible but widely used for the making of various products such as candles, high-pressure lubricants, as a cosmetics component, detergents, tanner of leather and many others, from 18th to 20th century (see Rice, D., 2002, Encyclopedia of Marine Mammals, p. 1163).

coastal whaling- In the early years of whaling when the shipping manufactory has not been quite developed, the whale hunting happened in waters close to the shore where a shore station was created to dress the whales and store the processed products. Whaling vessels were able to sail up to 100 miles from the shore station.[67].

pelagic whaling- this type of whaling in carried out in open oceans or seas in contrast to coastal whaling which is done in waters adjacent to the land. The hunting and processing of the harvest is executed on factory ships or catcher boats with factory facilities and does not depend on land station where the carcass has to be landed and rendered (Encyclopedia of Marine Mammals, 2002, p.1363).

factory ship- is a large ocean vessel equipped with all necessary facilities for discarding the whales carcass, processing the oil and storing the derived products. It is designed to sail on long distances and is supplied with all the essentials needed for the

[67] The Great Soviet Encyclopedia, 3rd Edition (1970-1979). © 2010 The Gale Group, Inc.

APPENDIX I

crew to endure continuous cruises. In most of the cases it is escorted with catcher-boats, which can carry fuel and other provisions but also help in the hunt of whales.

flensing- the process of removing the blubber from the whale's corpse.

incidental take (by-catch) - refers to not intended catch of whales. It happens when the whale entangles in nets of fishermen who harvest other species.

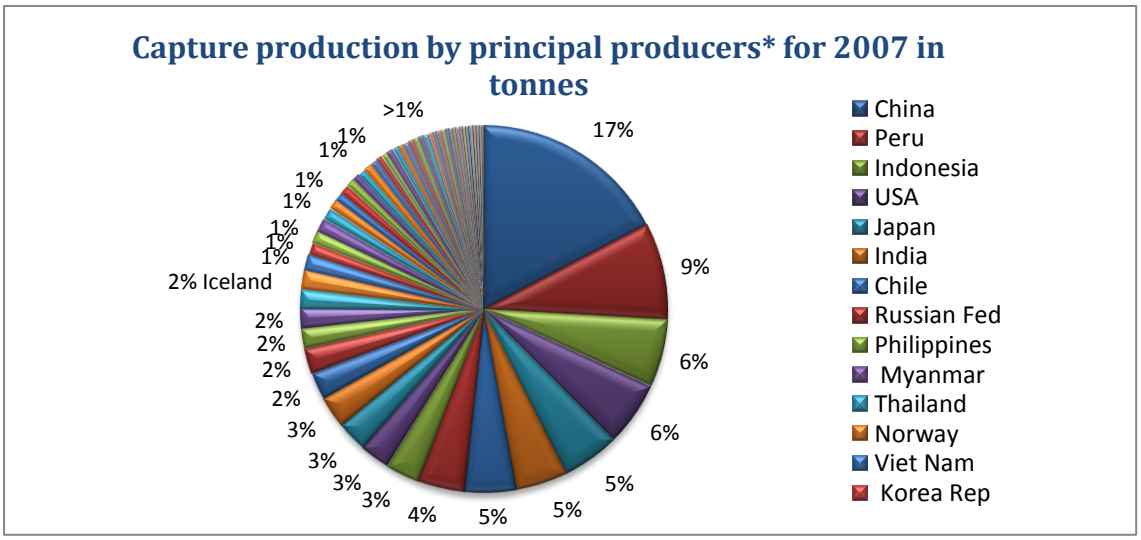
overharvesting (overexploitation; depletion; reduction; exhaustion) of whales as natural resources - it is hunting of a species in a scale that the normal reproduction rate cannot sustain till the moment that the size of a given stock is driven close to extinction. In practical terms, the reduction of a valuable living resource to such a low level that its exploitation is no longer economically sustainable (Encyclopedia Britannica, 2010).

high seas- oceans, seas and waters outside of national jurisdiction are referred as high seas. Individual countries have jurisdiction over territorial waters which include a belt of coastal waters extending to 12 nautical miles of the baseline (coast). Territorial waters are sometimes used to describe these 12 nautical miles plus the Exclusive Economic Zone which extends further 200 nautical miles. Sailing and harvest in high seas is regulated by international agreements such as the United Nations Convention on Law of the Sea from 1982.

APPENDIX II

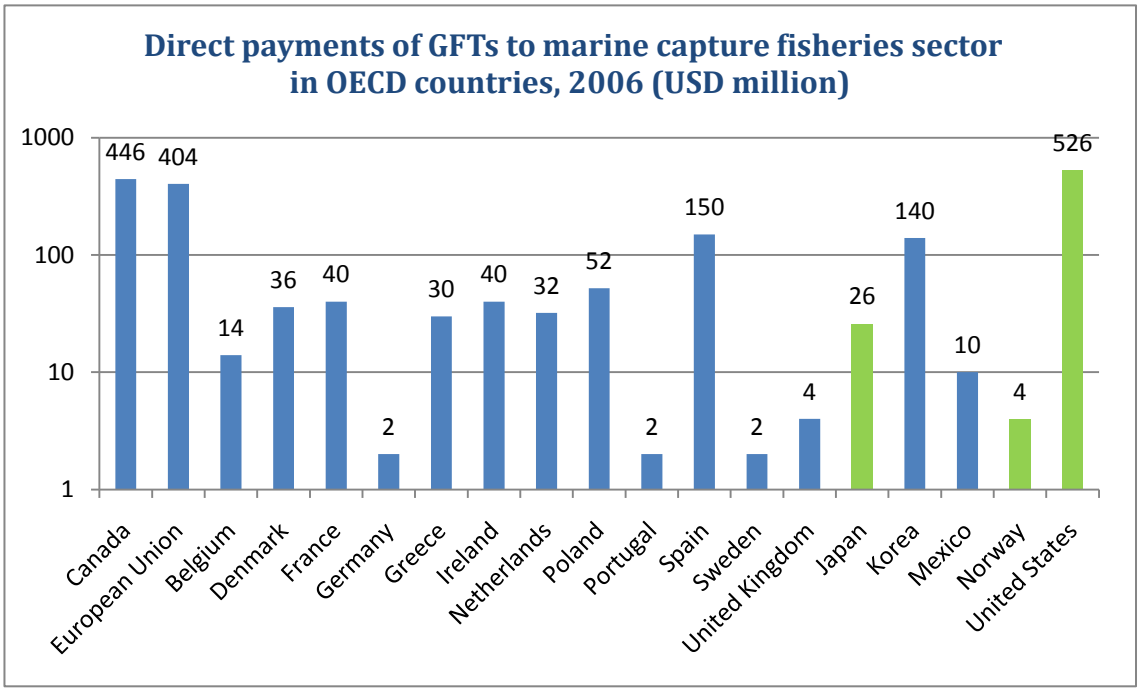
WORLD OVERVIEW OF THE WHALES RESOURCES

Figure 4. The biggest producers of capture fish in the World for 2007



Source: FAO statistics
*Countries with capture production of 200 000 tonnes or more.

Figure 5. Direct payments of GFTs for selected countries in 2006



Source: OECD, country

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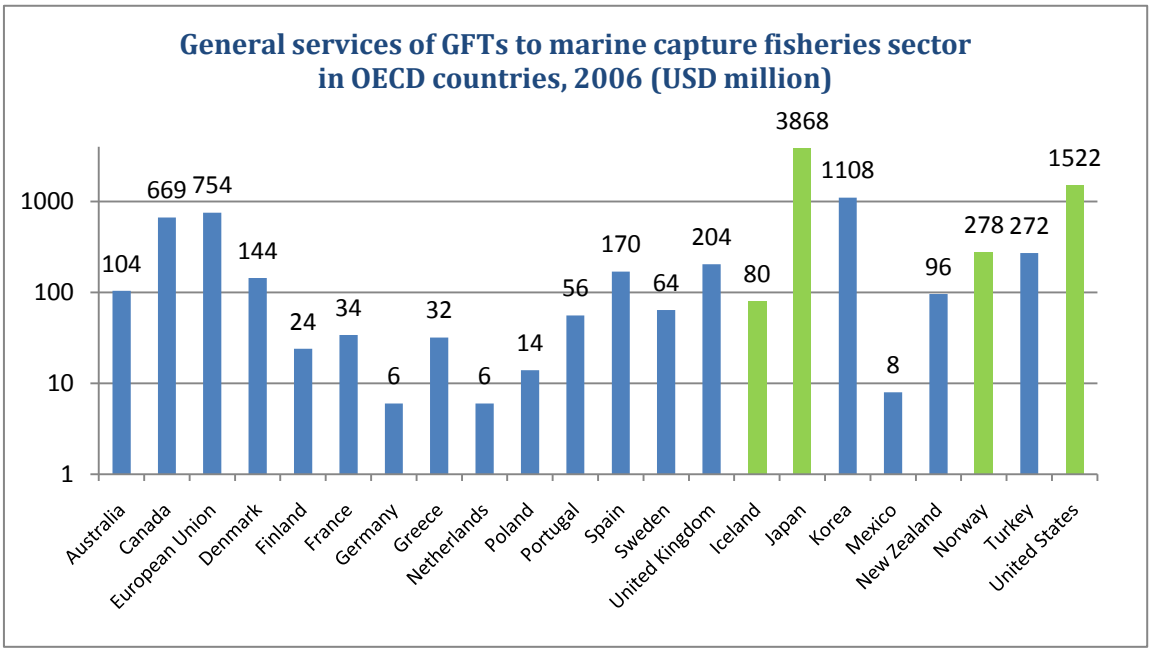
Figure 6. General services part of GFTs for selected countries in 2006



Source: OECD, countries' submissions.

JAPAN

Table 4. Sources of whale products (including whales, dolphins and porpoises) and estimated yearly consumption in Japan, 1990-1998 (tonnes)

Year	Scientific (research) whaling	Small-type coastal whaling	Drive and hand harpoon fisheries	Incidental Ta k e	Yearly change in stocks	Estimated yearly consumption
1990	1384	325	1394	62	-2023	5188
1991	1483	371	1040	16	-1501	4411
1992	1259	369	761	25	-1123	3537
1993	1536	372	854	43	-696	3501
1994	1445	344	849	50	55	2633
1995	1656	377	817	59	-282	3191
1996	2102	377	970	84	110	3423
1997	2189	366	986	84	-108	3733
1998	1989	361	704	74	-448	3576

Sources: Anon., 1996; Anon., 1996-1998; Anon 1991-1999; Anon., 1976-1998; cited by Ishihara and Yoshii (2000)

APPENDIX II

Table 5. Japan, annual consumption of meat (kg) per capita between 1994 – 1998

item	1994	1995	1996	1997	1998
Aquatic Animals, Others	0,59	0,49	0,59	0,54	0,39
Bovine Meat (beef etc.)	10,75	11,26	10,65	10,61	10,80
Demersal Fish	11,99	13,11	13,40	13,36	12,51
Freshwater Fish	5,94	5,80	6,21	5,76	5,56
Marine Fish, Other	7,32	6,88	6,74	7,04	6,14
Meat, Other	0,29	0,29	0,26	0,22	0,21
Mutton & Goat Meat	0,37	0,38	0,32	0,29	0,28
Offal, Edible	3,20	3,25	3,13	3,01	3,05
Pelagic Fish	21,10	18,54	16,17	14,83	15,92
Pigmeat (Pork)	15,14	17,12	18,00	16,39	16,33
Poultry Meat	13,78	14,68	14,74	14,43	14,39
TOTAL	**90,47**	**91,80**	**90,21**	**86,48**	**85,58**

Source: FAOSTAT | © FAO Statistics Division 2010

Table 6. Japan, whale-watching industry

Year	Number of whale-watchers	AAGR	Number of operators	Direct expenditures in USD	Indirect expenditures in USD	Total expenditures in USD
1991	10,992	N/A	N/A	371,000	4,377,000	4,748,000
1994	55,192	71.20%	N/A	3,384,000	20,155,000	23,539,000
1998	102,785	16.80%	45	4,300,000	28,684,000	32,984,000
2008	191,970	6.40%	104	7,375,076	15,345,902	22,720,978

Source: IFAW © 2009

*AAGR- Average Annual Growth Rate

APPENDIX II

ICELAND

Table 7 . Iceland, annual quota and total catch of whales (2007-2010)

Year	Species	Self-allocated quotas	Total catch in numbers	Total catch in tonnes*
2007	Fin whale	9	7	n.a.
	Minke whale	30	7	
2008	Fin whale	n.a.	0	n.a.
	Minke whale	40	38	
2009	Fin whale	200	125	1500
	Minke whale	200	81	
2010	Fin whale	200	148	1776
	Minke whale	200	60	

*Source : WDCS (April 2010) ; *INCA and IFAW (2nd December 2010)*

Table 8. Iceland, whale-watching industry

Year	Number of whale-watchers	AAGR*	Number of operators	Direct expenditures in USD	Indirect expenditures in USD	Total expenditures in USD
1991	100	N/A	1	17,000	43,000	60,000
1994	200	26%	4	32,000	114,000	146,000
1998	30,330	251%	12	2,958,000	3,512,000	6,470,000
2008	114,500	14%	10	6,618,087	10,090,900	16,708,987

Source: IFAW © 2009

*AAGR- Average Annual Growth Rate

Table 9. Iceland, export of whale products

Period	Partner	HS 2007 Code	Trade FOB Value in USD*	Trade FOB Value in ISK	Trade Quantity (kg)
06/2008	Japan	2084001	746 374	94 038 488	81 774
07/2008	Faroe Islands	2084001	5 732	722 927	909
01/2009	Denmark	23011001**	632	79 043	775
03/2009	Denmark	23011001**	14 409	1 802 658	2 275
01/2010	Latvia	2084001	2 452	306 781	250
01/2010	Japan	2084002	2 396 140	308 215 584	134 026
03/2010	Japan	2084002	1 165 922	152 626 830	88 191
04/2010	Japan	2084002	n.a.	216 675 981	149 192
08/2010	Faroe Islands	2084001	n.a.	42 572 775	250
08/2010	Japan	2084002	n.a.	210 273 467	129 600
09/2010	Japan	2084002	n.a.	209 255 604	129 915
10/2010	Faroe Islands	2084001	n.a.	181 019	400
TOTAL:	-	-	4 331 661	1 236 751 157	717 557

*Source: Statistics Iceland, www.statise.is *Source: Reinventing the whales (2010)a report by WDCS*
***23011001- Icelandic customs tariff code for whale meat*
HS 2007 codes: 2084001 and 2084002-Fresh or frozen meat from whales, dolphins and porpoises

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NORWAY

Table 10. Norway, annual catch and production of whale products (1982- 2007)

Year	Whales caught	Annual quota	Production							
			Total		Meat		Blubber		Animal feed	
	Number	Number	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
			Tonnes	NOK 1 000	Tonnes	NOK 1 000	Tonnes	NOK 1 000	Tonnes	NOK 1 000
1982	1 963		3 529	39 837	2 631	37 338	873	2 478	25	21
1983	1 869		3 491	45 617	2 583	40 455	896	5 152	12	10
1984	804		1 947	32 681	1 439	28 513	477	4 096	30	72
1985	771		1 839	34 626	1 406	30 525	427	4 095	6	6
1986	383		1 008	20 489	790	18 842	213	1 642	5	5
1987	375		1 003	21 294	827	21 100	174	2 193	1	1
1988	329		42	816	33	808	-	-	9	9
1989	317		22	508	19	505	-	-	3	3
1990	35		8	231	8	231	-	-	-	-
1991	-		-	-	-	-	-	-	-	-
1992	395		150	3 232	121	3 228	28	3	1	1
1993	-		454	16 253	353	16 196	91	46	10	10
1994	280	319	478	15 724	422	15 695	58	22	7	7
1995	217	232	456	13 068	335	10 298	119	2 755	2	15
1996	388	425	681	15 379	556	15 365	123	12	2	2
1997	503	580	779	22 029	732	21 934	46	94	1	1
1998	624	671	1 144	27 365	912	26 747	226	592	6	26
1999	589	753	996	24 271	839	23 814	157	457	-	-
2000	487	655	809	21 622	713	21 404	96	218	-	-
2001	552	549	1 141	27 407	837	25 729	304	1 678	-	-
2002	671	671	974	27 623	911	27 617	63	6	0	0
2003	647	711	895	26 270	894	26 267	1	3	-	-
2004	543	670	704	20 711	704	20 711	-	-	-	-
2005	634	797	834	24 226	834	24 226	-	-	-	-
2006	545	1052	698	20 819	689	20 774	9	45	-	-
2007	597	1052	767	24 129	762	24 129	0	0	-	-

Source: Statistics Norway, www.ssb.no

Table 11. Norway, whale-watching industry

Year	Number of whale-watchers	AAGR*	Number of operators	Direct expenditures in USD	Indirect expenditures in USD	Total expenditures in USD
1991	4,563	N/A	1	459,000	1,148,000	1,607,000
1994	11,227	35.00%	3	834,000	3,733,000	4,567,000
1998	22,380	18.80%	8	1,632,000	10,411,000	12,043,000

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2008	35,360	4.70%	20	3,915,300	6,101,000	10,016,300

Source: IFAW © 2009

*AAGR- Average Annual Growth Rate

Table 12. Norway, export of products with code: HS 2007, 020840- Other meat and edible meat offal, fresh, chilled or frozen of whales, dolphins and porpoises

	1999	2002	2003	2005	2006	2008	2009
	Quantity (kg)	Quantity (kg)	Quantity (kg)	Quantity (kg)	Quantity (kg)	Quantity (kg)	Quantity (kg)
Denmark			1 200				
Faroe Islands		431	8 345	60	250	720	1 920
Iceland		24 605	4 268				
Japan						5 195	
United Kingdom						75	
Netherlands	63						
Denmark	21 826						
GR Greece							124

Source: Statistics Norway, www.ssb.no

UNITED STATES OF AMERICA

Table 13. USA, whale-watching industry

Year	Number of whale-watchers	AAGR*	Number of operators	Direct expenditures in USD	Indirect expenditures in USD	Total expenditures in USD
1991	3,243,025	N/A	145	37,506,000	155,424,000	192,930,000
1994	3,600,000	3.50%	220	41,632,000	172,520,000	214,152,000
1998	4,316,537	4.60%	268	158,385,000	198,635,000	357,020,000
2008	4,899,809	1.30%	459	508,672,475	447,942,829	956,615,304

Source: IFAW © 2009

*AAGR- Average Annual Growth Rate