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**THE IMPACT OF THE EYJAFJALLAJÖKULL-ERUPTION ON THE IN-  
BOUND TOURISM IN ICELAND**

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<p>The purpose of this thesis was to study the impact of the Eyjafjallajökull-eruption on the inbound tourism during the remaining months of that year, i.e. until the end of the year 2010.</p> <p>The volcano eruption in Iceland caused worldwide chaos in the aviation transportation. The majority of the air transportation in Europe was cancelled because of the ash in the atmosphere. This had an impact also into the number of passengers travelling to Iceland. Since the reputation as a tourist destination country is constantly being developed, this work concentrates on the change in the inbound tourism in Iceland.</p> <p>The theory part consists of two major topic, tourism and natural disasters. The tourism part discusses the importance of transportation and the economic, social and environmental impacts of tourism. The part about natural disasters discusses about their impacts on the economy and the actions towards safety and security as a matter of natural disasters.</p> <p>The research was conducted by studying secondary data and literature review. Majority of the secondary data were received from the Icelandic Tourism Board and statistics of Iceland. Information about the volcano eruption was received in the informational sessions held by the Civil Protection in Iceland, Almannavarnir (local authority), representatives of Icelandair airline operator and Keflavik airport, representatives of geological institute in Iceland.</p> <p>The results are presented through figures and tables of the tourism flow to Iceland, and comparing the numbers to the total number of passengers going to Iceland including Icelanders. In addition to this, the number of passengers is compared to the inbound tourism in Finland in the summer of 2010.</p> <p>The final results show a positive impact on the inbound tourism to Iceland for the last quarter of the year, even though the first two quarters show a decrease in the tourism numbers.</p>	
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<p>Tämän opinnäytetyön tarkoituksena oli tutkia Eyjafjallajökull- tulivuorenpurkauksen vaikutusta Islantiin saapuvaan matkailuun. Islannin tulivuorenpurkaus vaikutti maailmanlaajuisesti lentoliikenteeseen. Suurin osa Euroopan lentoliikenteestä jouduttiin sulkemaan ilmatilassa olevan tuhkan vuoksi. Lentoliikenteeseen aiheutuneella katkolla oli suuri vaikutus myös matkustajalukuihin. Tässä työssä keskitytään Islantiin saapuvan matkailun muutokseen.</p> <p>Teoriaosa koostuu kahdesta aihealueesta: matkailusta ja luonnonkatastrofeista. Matkailuosiossa tarkastellaan kuljetuksen tärkeyttä ja matkailun vaikutuksista talouteen. Luonnonkatastrofosiossa tarkastellaan niiden vaikutusta talouteen sekä turvallisuustoimia luonnonkatastrofien varalta.</p> <p>Tutkimus tehtiin sekundaaristen tietolähteiden ja kirjallisuuden pohjalta. Suurimman osa sekundaarisesta tietolähteistä tarjosi Icelandic Tourism Board ja Islannin tilastokeskus, Hagstofa Íslands. Suurin osa tulivuorenpurkaukseen liittyvistä tietolähteistä on peräisin informaatiotilaisuuksista, jotka Almannavarnir (paikallinen viranomaistoimisto), lentoyhtiö Icelandairin ja Keflavik-lentokentän edustaja, sekä geologisen laitoksen instituutin edustajat.</p> <p>Tulokset esitetään Islantiin saapuvien matkailijoiden määrästä muodostettujen kuvaajien ja taulukoiden avulla. Kuvaajissa tarkastellaan Islantiin menevien kansainvälisten matkailijoiden määrää vertaillen kaikkiin Islantiin menevien matkailijoiden määrään. Tämän lisäksi, määrää vertaillaan Suomeen saapuvien kansainvälisten matkailijoiden määrää kesällä 2010.</p> <p>Vuoden 2010 kaksi ensimmäistä neljänestä osoittavat laskusuhdannetta Islantiin saapuvien matkailijoiden osalta. Lopputuloksissa ilmenee positiivinen vaikutus Islantiin saapuvien matkailijoiden osalta vuoden kahden viimeisen neljänneksen aikana.</p>	
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## PREFACE

The idea for my thesis was born in Iceland during my internship in the Embassy of Finland in Reykjavik. I was attached to the subject throughout my internship since I was reporting and observing the situation in Iceland constantly during the volcano eruption. I am very glad to be able to discuss in my thesis about the two major issues, economy in Iceland and volcano eruption, which I was to follow-up along the internship.

A great gratitude belongs to my thesis supervisor Mikko Keränen for the advice and help along the whole process of writing this thesis. I find the help received very valuable since much of the topics discussed were out of my field of study.

Kajaani,

Jenna Heikkinen

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## 1 INTRODUCTION

The purpose of this thesis was to study the impact of the Eyjafjallajökull-eruption on the inbound tourism during the remaining months of that year, i.e. until the end of the year 2010.

The research was conducted by studying secondary data and literature review. Majority of the secondary data sources was received from the Icelandic Tourism Board and statistics of Iceland. Information about the volcano eruption was received in the informational sessions held by the Civil Protection in Iceland, Almannavarnir (local authority), representatives of Icelandair airline operator and Keflavik airport, representatives of geological institute in Iceland.

The results are presented through figures and tables of the tourism flow to Iceland. Figures also indicate the change in the number of the inbound tourism to Iceland in comparison to the previous years. The numbers of passengers are allocated into countries, market areas and point of entries. In addition to these, the annual number of passengers is allocated into months, thus it is easier to compare the years and the change. Finally, the number will be compared to the total number of passengers including Icelanders and comparison also to the inbound tourism to Finland in the summer of 2010.

This study concerns only the impact on the year 2010. No resources for later tourism figures were available while this study was conducted, i.e. during the spring 2011.

The final results show a positive impact on the inbound tourism to Iceland for the last quarter of the year.

There exist several factors which might have a potential impact on the tourism flow. In the first part of the eruption in March, many tourism operators organised different kinds of trips to Iceland. The Ministry of Tourism in Iceland organised together with Althingi (the Government of Iceland) a forceful campaign called Inspired by Iceland. It included a lot of media attention to the safety of Iceland. Also Iceland-hour was organised to get more media attention for Iceland. Icelandic subscriber connection operator Siminn provided free calls to abroad from Iceland to promote the safety of Iceland. Thus the public could participate to the recovery process as well.

Iceland experienced heavy recession, which started on the fall of 2008. Economic crash, *kreppa*, started when the biggest banks lost their ability to pay back the loans. Now that tourism has had increasing importance as the source of economy, it was highly valued to sustain the growth in inbound tourism.

When investigating the inbound tourism figures a steady upward slope has been the case for past years. A remarkable downward trend after 2008 incurred and slight decreased after 2009 in the total number of inbound tourism. In the beginning of the year 2010 there was a slight increase in the inbound tourism. From April until June, the tourism flow decreased intensively in comparison to the previous year. But the last quarters of 2010 show a slight increase in the tourism flow.



## 2 TOURISM

### 2.1 Definitions

The World Tourism Organization (UNWTO) has described tourism as people travelling to and staying in a place outside their usual environment for not more than uninterrupted year for leisure, business and other purposes. Tourism has many definitions, but the main feature that most of the definitions carry is the extraordinary experiences, outside of normal patterns of daily life at home. (UNWTO 2010.)

The key term in this study, an inbound tourist, means non-residents visiting other than their own country. On the contrary to inbound tourism, outbound tourism indicates the residents of a country visiting other than their own country. (Bowen & Clarke 2009, 4).

### 2.2 Tourism Types

Tourism can be categorised according to the reasons to travel. **Recreation travel** is voluntarily undertaken for pleasure and satisfaction purposes. This happens through leisure time. Swarbrooke, Beard, Leckie and Pomfret (2003, 6.) distinguish **recreation** and **leisure tourism** with simple distinction. Leisure is identified with time and recreation with an experience which is goal oriented. This type of tourism includes holiday, sports and cultural tourism and visiting friends and relatives. **Business travel** includes meetings, conferences, missions, incentive and business tourism. Finally, other tourism purposes can be study and health purposes. (Cooper, Fletcher, Fyall, Gilbert & Wanhill 2005, 18.)

The purpose of **ethnic tourism** and **cultural tourism** is to observe and experience the culture and lifestyles of tribes and cultures. The activities at the destination include several cultural activities. **Environmental tourism** is very similar to ethnic tourism, but the emphasis is on natural and environmental attractions. **Recreational tourism** has a focus on sports, curative spas, sun bathing and social contacts in a relaxed environment. **Business tourism** is considered as important tourism type. It often includes besides its core purpose incentives and extra activities. (McIntosh, Goeldner & Ritchie 1995, 197-198.)

**Adventure tourism** is often categorised under alternative tourism. Adventure travel describes the person's motives of travel as exploration, study, business, communication, recreation, sport or sightseeing and tourism. Person travels from known surroundings to unknown places close to nature. Adventure travel is said to be more extensive than tourism or leisure. The reason can be because this type of tourism includes goals that could be related to professional activity. Adventure seeks to be something apart and escaped from every day concerns. (Swartbrooke, Beard, Leckie & Pomfret 2003, 6, 12-13.)

**Ecotourism** highlights an appreciation of nature environment, a responsible form of travel and its educational factors. A person is motivated in ecotourism to fulfil his/her educational needs, which result when a person is interacting with nature. Ecotourism is conceived to have educational interactions with nature. It is also considered to be as a sustainable tourism. Generally speaking, it is attains to be low-impact, locally oriented and non-consumptive. (Fennel 2008, 24.)

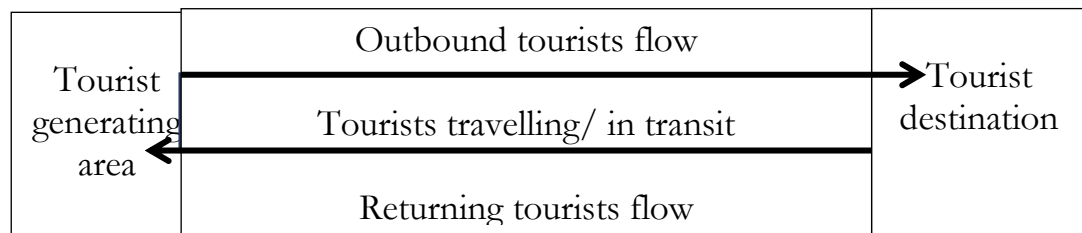
### 2.3 Transportation and Tourism

The concept of transportation is a significant factor when considering the whole range of activities which are related to tourism. Furthermore, the transport sector comprises of amalgam of factors. (Page 2009, 7.) Transportation is the means of reaching the destination, movement at the destination and in minority of instances the actual tourism attraction or activity. There are three major modes of travelling: land, water, and air. Furthermore, four basic elements can be found in a transport system. Those are the way, the terminal, vehicle and the motive power. The availability is highly important when considering the transport modes. The infrastructure of transportation has become increasingly important while the tourism demand grows. As the tourism demand grows, the destination resorts, their attractions and resources are developed and expanded. The most burning issues for most transportation operators are safety, security, competition, profitability and customer tastes. The travel experience must be both pleasurable and it fulfils consumer's expectations. (Cooper, Fletcher, Fyall, Gilbert & Wanhill 2005, 462, 469; Page 2009, 16.)

Tourism is said to consist of four integrating components, which are the market, the travel element, the destination and the marketing mechanism. All of these elements are linked to each other, e.g. by flows of information. To understand the whole concept of tourism sys-

tem, Laws (Page 2009, 19) formed a map of the framework (Figure 1.). This includes a tourist, a traveller-generating region, tourism destination regions, transit routes for tourists travelling between generating and destination areas and the travel and tourism industry (e.g. accommodation, transport, the firms and organisations supplying services and products to tourists). Transport forms an essential part of tourism system. It connects the tourist-generating region to destination regions. (Page 2009, 19.)

Figure 1. A tourist system



Sea transport can be often utilised among tourists for either functional reasons or combined with wider tourist experience. Marine tourism represents cruise, functional marine and personal water transport tourism. Duval (2007, 120) argued that marine tourism has increased substantially over the past few decades.

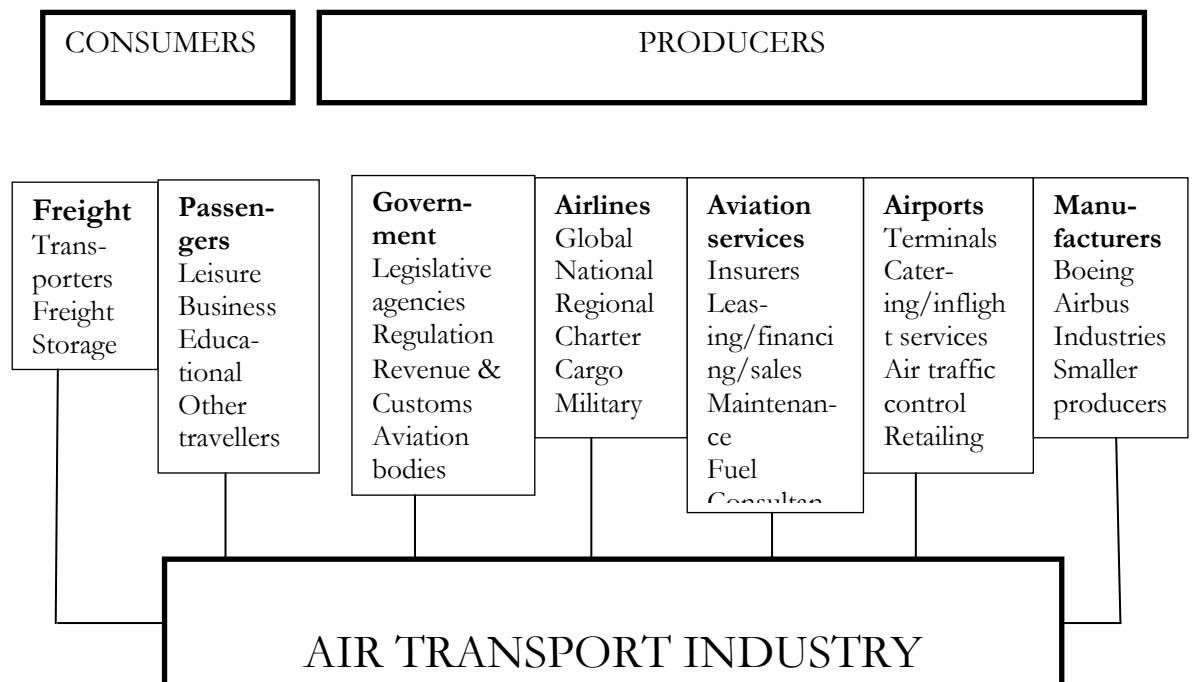
### 2.3.1 Air Transport Industry

Air transport plays an essential role in the tourism development and tourist flows. An air transport typology includes network carriers, regional airlines, charter carriers and LCC/LCLF airlines. Each of these can have different impacts on tourism flows. (Duval 2007, 153) ATAG stressed in their website the importance of aviation transport system to the economic growth. Now up to 40% of international passengers travel by air. The increased utilisation of air has also increased the amount of jobs for direct, indirect, induced and catalytic impacts. Air transport is also the most efficient utilizer of resources; occupancy rates are over 70%, which is over double of the same rates in rail and road transportation. (ATAG, 2011.)

Air transport industry consists of consumers, producers and other additional parts of it. The Figure 2 below illustrates the structure and all what is included in each factors of it. Consumers include freight and passengers. Freight refers to transporters, freight and storage.

Passengers-section includes passengers with different purposes of travel, i.e. leisure, business, educational and other travellers. Producers refer to a government, airlines, aviation services, airports and manufactures. Governmental bodies are legislative agencies, regulations, revenue and customs, and other aviation bodies. Airlines refer to global, national, regional, charter, cargo and military airlines. The services in aviation are insurers, leasing, financing, sales, maintenance, fuel and consultancy. Airports refer to terminals, catering and inflight services, air traffic control and retailing. Finally the manufacturers are Boeing, Airbus, other industries and smaller producers. The economic impact of the whole global aviation and tourism sector is significant and thus should be taken into account. (Page, 2009, 8.)

Figure 2. The structure of an air transport industry (Page, 2009, 8.)



All the factors in the global aviation and tourism sector are affected economically. The factors can be allocated into 3 categories which are direct expenditure, government expenditure and indirect expenditure. Direct expenditures of global aviation normally consist of salaries, fuel, servicing and services, and also investments. The direct employment in aviation field accounts for around 5,5 million jobs globally. These direct expenditures are then taxed. Taxation happens through the salaries, fuel, services and investments and also e.g. the tickets sold. The government spends to the induced expenditures and furthermore to induced em-

ployment. Direct expenditures are the tourists trips, which were estimated to be 2,2 billion passenger trips annually according to Page (2009, 9). Tourist spending is included into the indirect expenditures through the travel agencies, hotels, restaurants, transport and car hire. Thus indirect employment is also created. 6,3 million jobs are offered in this category, from which 66% constitutes of European and North American vacancies. The global tourism employment is 192 million jobs, which accounts for 12 % of the world's GDP (Gross Domestic Product). (Page 2009, 9.)

## 2.4 Impact of Tourism

When examining the impacts of tourism, the focus will be on the relationship between tourism and the destination. The division into three concepts of impacts - economic, social and environmental impacts- is done along the approach.

Tourism is seen as an export industry. Input-output multiplier concept will be used to describe the economic impacts with the additional dimension of being able to simulate economic changes as well. Thus it will be possible to draw up 'net' economic impacts. In general, tourism affects in the economy to employment, taxation revenues, trade, infrastructure, redistribution of income and employment. Tourism provides both revenues and losses to the economy. (Ryan 2003, 149-157.)

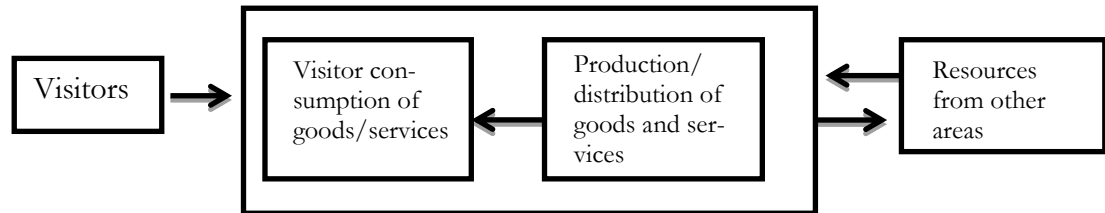
Social impacts of tourism are related to the behaviour, activity and social exchanges at the network of the locals. Tourism can impact on the entrepreneurial activity, social activity and buying behaviour. (Ryan 2003, 277) Environmental impacts can be both negative and positive. Tourists are often seen as a threat to the environment. However, tourism affects to the environment when the visited areas are under for example construction or restoring actions. (Newsome, Moore & Dowling 2002, 79.)

### 2.4.1 Economic Impacts of Tourism

A lot of data has to be analysed in order to find the economic impacts of tourism. Finding right data and the way to use it, analysing and making the results are key factors when finding base for the actual impacts. Finding relationships and correlations between certain eco-

conomic variables are essential to find the results e.g. income, investment flows and job creation. (Ryan 2003, 152.)

Figure 3. Tourism as an export industry (Gee, Makens & Choy 1997, 156.)



The figure above illustrates the situation where visitors, as an export, come from outside economy and purchase goods and services in the host community. They bring in new revenues from external sources. Should the host community provide the goods and services locally, the revenue will stay in the host economy. If goods and services are imported, revenue will not stay totally in the host economy. (Gee, Makens & Choy 1997, 156.)

Earning and spending of a tourist are described as exports and imports. Earning of a foreign exchange is earned by overseas visitors and contributors, thus called exports. Correspondingly, the spending of a country's citizens in overseas contributes as a loss to the economy and is therefore seen as import. (Ryan 2003, 149-150.)

### The Measurement of Economic Impacts

A multiplier concept will be used to approach the measurement of economic impacts. Multiplier is a factor, which shows how much an endogenous factor changes in response of exogenous factor. The multiplier concept is based on the fact that sales for one firm require purchases from other firms within the local economy. This means, that firms not only purchases primary inputs such as labour and imports, but also intermediate products and services manufactured by other institutions within the local economy. Keanes claimed that economic growth was ruled by two major activities of flow: "leakages" and "injections". (Ryan 2003, 159.)

Leakages are formed by savings, taxation and imports. Savings withdraw money from the economy, because the demand is decreased and hence employment diminishes. Savings insert money only when it is used through intermediaries to invest. By increasing taxation,

economy withdraws money from the economic system and again the level of demand drops. Imports are leakages for the economy because the source, employment and profit are situated in overseas. Thus it is a loss for the importing economy. (Ryan 2003, 159-160.)

Injections are investments, exports and government expenditures. Investments itself create employment and creates income for the economy, also for the future, because it added productive capacity by adding new equipment. Export means selling goods to overseas, hence it is profit gained from overseas. Government expenditures refer to financial investments and also transferring money to individuals who consequently increase the level of demand when purchasing goods and items. All in all, the injections cause economic growth. From a tourism viewpoint, investment on a building is an export-investment and import-saving. It is an attraction for both tourists overseas and citizens of the economy. (Ryan 2003, 159.)

The government of the tourist-receiving country receives the taxation revenues, when visitors are spending in a host country. Thus visitors are seen as a source of taxation revenue for the government. Taxation revenue can be direct, as a certain tax on visitors. Anyhow, it can also be indirect as in the normal mechanism such as sales tax or value-added taxation. (Ryan 2003, 149-150.)

The businesses in the tourism industry gain profit from the visitors spending in a host country. In turn, these organizations provide services and capital to the tourism industry. While visitors are generating profit to the host economy and tourism industry offers services and capital, employment is created. (Ryan 2003, 149-150.)

There exist profits which are defined as above-normal profit that is offered through transport operations such as airports, port expenditure (including crew expenditure). Dwyer and Forsyth (1998) termed these benefits as externalities due to the fact that these operations would not normally occur if it were not for travel and tourism. Externalities arise should one person's production or consumption physically affect the consumption or production of others. (Ryan 2003, 149-150; Begg, Fischer & Dornbusch, 2005, 267.)

When demand for a currency arises from tourism movement altering the cost of the currency against the other currency, it benefits the economy on the terms of trade. (Ryan 2003, 149-150.)

Some countries can have significant importance from the tourism for their economy. For example, New Zealand, which is populated by 4 million people, the 2 million overseas visitors each year represents substantial increments to demand that permit economies of scale in some operations. Certainly, this effect is not restricted to countries that have small populations. Therefore the UK with its population of 58 million still derives economies of scale in various industries associated with travel by receiving about 20 million overseas visitors each year. (Ryan 2003, 149-150.)

As a final point, tourism offers the opportunity for redistribution of income and employment to regions that are traditionally peripheral to the mainstream of economic life. The reason for it can be because many of the tourism's assets (for example historical heritage and scenery) may be found in zones which are now marginal to the urban, First-World countries that dominate the twenty-first century. (Ryan 2003, 149-150.)

Each of these points draw, not only benefits, but also potential losses. If countries are categorized as tourist-receiving country, it should be also noted as a tourist-generating country. This means, tourists arrivals occur both positive and negative financial transactions. The number of tourist flows generates benefit, although the direction of the flow might be immaterial. For example, in airline operations, majority of travel requires both an outward and return trip. The income generated by these operations is finally dependent on the number of passengers. (Ryan 2003, 150.)

Ryan (2003) claims that tourism generates employment and income in economies, especially in vulnerable economies. He also points out that with careful progress plan, tourism can develop the nation's infrastructure. This can be done so that not only tourists are attracted, but the developed infrastructure fulfils locals' own needs. Hereby we can see that tourism can work as a pressure for developing infrastructures or that by getting pressures from government to develop tourism industry, income and employment are created. (Ryan 2003, 151.)

The size of the economic unit affects naturally to the level of economic development of the destination area. Receiving income from hotel tourists in village is more remarkable than receiving it in a town. It is also necessary to know the nature of tourists' activities they are willing to attend during their stay. Some might rather stay in a farm instead of a hotel in order to experience more of the local culture. Even though staying in a farm values more as an income for the farmer than for the hotel, income finds always its way to the local economy.



Thus the local economy, even supposing it is smaller proportion of the hotel revenue, may gain more from the hotel than from the farmhouse. This applies only when the companies are owned by the locals. (Ryan 2003, 154.)

Employment can not only generate economy, but also diminish it if the labour comes from outside of the area. In situations, where sufficient local labour cannot be found might lead to finding labour from outside the area. Many international firms may be preferably looking for labour outside the area with the intention of getting more sufficient labour. Local people might also be reluctant to work in a tourism industry due to their different economic base. Whether the reason is behind the locals or international owners, salaries will not benefit the local economy. (Ryan 2003, 155.)

The economic impact is highly dependent on the type of tourist. It is also very clear that the greater the number of tourists and the higher the average expenditure per tourist, the higher the revenue and the economic impact. Ryan mentioned also the importance of the nature of demand. In order to gain economic impact and revenue from the tourists, they have to require services that locals are able to provide. In other words, if mass tourists require services, which have to be supplied outside of the region, it can lead to trade-offs for any tourist planning authority. This is, the local will not gain notable revenues. (Ryan 2003, 157.)

Leisure traveling can fluctuate due to price changes or a change in income level of tourist. Fluctuations can affect to the host community's growth. Rapid growths, static growth and decline can put tourism dependent host economy on a shaky ground. Natural disasters have caused destroys in communities and discouraged tourists to travel in these places. Economy is sensitive for fluctuations. (Gee, Makens & Choy 1997, 162.)

#### 2.4.2 Social Impacts of Tourism

Social impacts of tourism are discussed in Ryan's (2003, 277) study. He refers to the increasing activity of the local residents as one of the impact of tourism. By activity he means entrepreneurial activities, offering accommodation or some additional facilities specifically for tourists.

Micro-individual interchanges relates to social exchanges at the level of individual experience. The measures that apply here include the number of interactions a resident has with out-of region arrivals, the duration and nature of those meetings, and the ways in which those meetings are characterised and evaluated. (Ryan 2003, 277.)

When a social and physical environment begins to change in response to increasing level of tourism, it is called macro-social impact. Increasing level of tourism can affect broadly in cultural and social pattern behaviour, thus it is called macro-social impacts. (Ryan 2003, 277.)

Visitor's consumption might also affect to the consumption behaviour of the local residents. By consuming the local goods and services, it raises the standard of living of the residents. The change in consumption might be positive or negative. The development activities may also conclude to competition of the own resources, for instance land use rights or water supply. (Gee, Makens & Choy 1997, 164-165.)

#### 2.4.3 Environmental Impacts of Tourism

In economics, tourism is seen as an export industry. Hereby, we see the environment as a free tourism product. Often it is changed or modified to facilitate the product for tourists. (Cooper, Fletcher, Fyall, Gilbert & Wanhill 2005, 196.)

Environmental impacts of tourism can be both positive and negative. The interest into natural area tourism can increase the development of such areas. Because of the use of wilderness areas and tourist destinations, tainted areas can be repaired, additional nature reserves created and even the national parks expanded. (Newsome, Moore & Dowling 2002, 79.)

The most significant source of tourism impacts are from recreational tourism. The changes caused by recreation tourism can occur after short period of time. Tourism can cause damages to the vegetation and soil by different kind of trampling in a nature areas. Anyhow, the level of impacts depends on the type of tourism, amount, and type of use, density and relative fragility of vegetation. (Newsome, Moore & Dowling 2002, 83, 86.)

Positive direct environmental noticed by Cooper et al (2005, 197) are the preservation/restoration of ancient monuments, sites and historic buildings. National parks and wildlife parks can be created and resorts e.g. reefs and beaches can be protected.

Cooper et al (2005, 198) pointed out few examples of negative impacts of tourism on environment. Hunting and fishing cause obvious impacts on wildlife environment. Over-use can destroy and erode sand dunes. Forests can be destroyed by camp fires and vegetation destroyed by walkers and vehicles.

### 3 NATURAL DISASTERS

#### 3.1 Definitions

“Natural hazard is a geophysical, atmospheric or hydrological event that has potential for causing harm or loss.” These events are said to be both uncommon and extreme, which also include risks. Natural hazards cause natural disasters when meeting vulnerability. Without vulnerability, natural disasters are not defined to cause natural disasters. (Benson & Clay 2004, 16.)

“Natural disasters are an area of multidisciplinary research and policy analysis.” A natural disaster is an occurrence of an abnormal or infrequent natural hazard in vulnerable communities or geographical areas, leaving the affected area unable to function normally. Disaster might cause substantial damage, distractions or casualties on the occurring area. As an example, Hurricane Katrina devastated the Gulf Coast of the United States and its business environment in 2005. Katrina also caused water disasters, an extensive flooding and storm surge that tropical cyclones can result in. Most of New Orleans was left under water. (Mori, 2010.)

Benson and Clay (2004) separated two major types of hazards differing in sense of economic vulnerability: hydro-meteorological and geophysical hazards. Hydro-meteorological hazard refers to climatic variability and droughts, floods, tropical cyclones and hurricanes. Both abnormally low and high erratic rainfalls are likely to affect the agricultural performance unfavourably. Furthermore, abnormally low rainfalls, i.e. droughts, might cause more severe affects than abnormally high rainfalls. (Benson & Clay 2004, 16.)

Geophysical hazard refers to earthquakes, volcanic eruptions and tsunamis. These are extreme events. The impact caused by such an extreme event depends on the location and the size of the economy it happens in. Volcanic eruptions and tsunamis usually have direct economic impact. (Benson & Clay 2004, 16.)

### 3.2 Impact of Natural Disasters

Hurricane Katrina resulted in extensive damages to properties, not to mention the hundreds of people who died during the hurricane and the floods that followed. Such a shocking natural disaster concluded to much more careful preparedness and awareness of natural hazards and actions to prevent events and reduce potential impact afterwards. Preparedness plays a major role. Special emphasis has to be put on the tailor-made procedures that each organization should eventually give an effort. (Mori 2010.)

From the economic viewpoint, disaster combines some losses and reductions. Losses occur in human, physical and financial capital. Reductions might occur in investments, income generation, consumption, production and employment in economy. Severe impacts might occur in financial flows such as revenue and expenditure of private and public bodies. (Benson & Clay 2004, 5.)

Vulnerability and sensitivity refers to the potential to suffer harm or loss in a macroeconomics. Since economic activity is sensitive for various events, it might be rather difficult to measure the economic impact of a certain disaster. Resilience means the recovery speed, which economy takes including investments, repair and repairmen of damaged capacity or lost. (Benson & Clay 2004, 7.)

Economic impacts have been investigated with an eclectic approach. Benson and Clay (2004) included in their investigation a quantitative investigation, which included combination of regression analysis, the use of charts to examine movement around trends, “before-and-after” comparison of disaster impacts and of forecasts and actual economic performance. They started with null hypothesis, which refers that there is no direct link between disaster shocks and the significant viewpoint of economic performance. These investigations allow further reflection and investigation. Eclectic political-economic analysis can be also made. (Benson & Clay 2004, 9.)

#### 3.2.1 Factors Determining Vulnerability

Along their research, Benson and Clay (2004) studied the dynamic nature of vulnerability. They focused on developmental, economic and societal factors’ interaction with natural haz-

ards. They had three case studies of economic impacts of natural hazards (Bangladesh, Dominica and southern Africa). After broad investigation they found out factors determining a broad macroeconomic vulnerability to natural hazards. Factors take in the nature of natural hazard, the general structure of an economy natural resource endowment, the geographic size of the country, the country's income level and stage of development and finally the prevailing socioeconomic conditions, including the policy environment and the state of the economy. In addition to these factors socioeconomic developments and the state of technical and scientific advancement have an influence on the vulnerability of the economy. It is also notable to say that vulnerability is time-dependent. (Benson & Clay 2004, 15.)

### 3.2.2 Economic Vulnerability to Natural Hazards

In short, the type of natural hazard the economy is exposed to and the structure and the stage of the economy are central factors determining the vulnerability of an economy. A change, like decline, also affects the vulnerability of economy. Agriculture is especially vulnerable to decline in macroeconomics. Economic wealth is usually measured by GDP which is affected by the economic development. The stage of economic development can be measured by the terms of degree in sectoral, geographic, and financial integration, levels of economic specialisation and government revenue-raising capabilities. Least developed and the simplest economies are usually being more vulnerable to hazards. It is so, even though the loss might be smaller relative to those levels in more developed and complex economic structures. (Benson & Clay 2004, 18.)

Poor intersectoral linkages, strong degree of self-provisioning and often weak transport infrastructure are some of the reasons for the high vulnerability of less complex economies to hazards. Some of the reliefs and rehabilitation might be covered with grants, support and assistance from overseas, but generally the recovering process is long for the undeveloped economies. In the case of severe destroys and the need of widespread constructions can exacerbate the existing problems with poverty and indebtedness. It has been pointed out that development can also alter the risk for the economy. (Benson & Clay 2004, 18.)

The reasons why more developed countries are less vulnerable to hazards is because they are often more open and have less foreign exchange constraints. Other factors for less vulnerability are higher investment in risk reduction and lower levels of poverty and developed en-

vironmental management. Furthermore, high amount of economic assets are owned by private sector and most likely insured. Thus, higher proportion of the relief and rehabilitation is covered by insurances, which means lesser losses for individual households and less external or domestic borrowings for the government. However, it must be noted that small segment of the affected population might still be severely affected by loss of savings, income and assets. (Benson & Clay 2004, 19.)

### 3.2.3 Financial and Economic Impacts

Natural hazards have severe negative short-term impacts. Hazards can affect also longer-term economic growth, poverty reduction and development. Vulnerability to severe consequences is changing along the transformation of economic situation; rapid economic growth, social change, technical developments and urbanization. Disasters might cause significant pressure on both more narrow fiscal short-term implications and long-term developments. Reallocation is essential act for natural disasters. A complete review of the economic and financial impacts should be made 18 to 24 months after the disaster. (Benson & Clay 2004, 2.)

The costs of natural disasters grew 15-fold between the 1950s and 1990s. Annual costs of natural disasters were US\$66 billion at an average. These figures have triggered increasing awareness of the impacts of economic and financial impact of natural disasters. However, much of the longer-term financial and economic impacts are not known. The focus of assessment of research has usually been on the most easily measured direct losses, i.e. the financial losses of visible physical damage. If longer-term impacts have been investigated, it has merely been case-study natured research. (Benson & Clay 2004, 3.)

Benson and Clay (2004) discussed in their research about the financial and economic impacts of the natural disasters using Dominica, the island economy as a case study. Their objectives were to understand wider financial and economic impacts of natural hazards, factors affecting vulnerability of the hazard-prone economies and the opportunities improving risk management and the way to implement into these economies. (Benson & Clay 2004, 3.)

Especially small island economies tend to be at a risk when affected by natural hazard. A cyclone or volcano erupt can destroy some of the transport, power and communications

network. It can disrupt productive capacity and social infrastructure. All of these can be a harmful setback for a small island economy. (Benson & Clay 2004, 19.)

There can be countless of factors affecting the impact of natural hazards. However, Benson and Clay listed some of the, rather random, influencing factors. First noted factors are the policies concerning macroeconomic programs, such as stabilisation or structural economic reform programs. Secondly the poverty reduction social strategies and medium-term economic strategies are considered factors having dynamic influence. There are also domestic sectoral policies, such as those concerning food marketing or foreign exchange management. Those considered policy changes, (for example controlling inflation, encourage reinvestment, or generate revenue to meet the costs of reinvestment) are affecting factors. The external policies which affect to the pattern of production activities, coincidental fluctuations in primary exports and import prices, which consequently influences on the balance of payments and inflation, other shocks, disasters, health hazards are factors influencing the economy as well. (Benson & Clay 2004, 19.)

From the adverse point of view, some economists have suggested natural hazards to have more positive impact on economy, than negative. The phenomenon was compared to the impacts of war. Natural hazards are often short in duration. There might be significant losses in housing and transportation, but economists have claimed that the productive capacity is not harmed by the natural hazards. Human capital tends to be unaffected. Economists claimed the recovery time is usually shorter than in the case of war; investment recover more rapidly. In the case of wars, the impact is more severe. The duration of war is often longer. Wars cause loss of capital and human, which consequently has an impact also in productive capital. The recovery time after a war is longer, when the losses have been more severe. The reason for the growth in GDP was found behind the new innovations taken by the disaster research. The recovery process for the affected economy brings innovations with technology and infrastructure and thus brings often growth in GDP. (Benson & Clay 2004, 21-22.)

#### 3.2.4 Short-term Impacts of Natural Hazards

At first, disasters usually cause a decline in GDP growth. In the study, where 35 disasters were investigated, 28 of them had decline in GDP right after the disaster and sharp rise within two years after the disaster. The real effects must be studied with in-depth investiga-



tion. Each country and disaster is different and the countries' GDP growth might be affected by variable factors. (Benson & Clay 2004, 22.)

Because small island economies are said to be more vulnerable to natural hazards, the negative impact on short-term performance was studied. In the case of Bangladesh, the clear volatility in the economy after a natural disaster was found. This volatility was compounded by the disorder before and after their Independence War in 1971. After the reconstruction of the country's economy, the amplitude of disaster shock diminished. Reintegration and subsequent structural transformation of the economy has reduces vulnerability to natural hazards. (Benson & Clay 2004, 22.)

The phenomenon might be different when investigating geographically larger countries. For example in Philippines, which is situated in natural hazard-prone region, the impact of natural hazards might vary according to the nature of the hazard. In the case of drought, which is affected by special region, might not affect the national economy. However, the country has frequent occurrence of tropical cyclones or extreme floods, which makes it more difficult to measure and compound the economic impacts. (Benson & Clay 2004, 22.)

### 3.2.5 Long-term Impacts

There has been rather little investigation of long-term impacts along the history. However, some investigations highlight strongly the roles of capital, labour growth and productivity. Natural hazards can affect negatively the capital assets and other resources. Also the intact capital and labour can be reduced by a disruption in infrastructure and markets. In most of the cases of hazards, direct capital losses can occur. The changes in the government expenditures may occur. For example Government can divert the resources from planned investments into relief and rehabilitation, or social reconstruction. Government can also fund relief and rehabilitation by external borrowings which increase the future-servicing payments. It must be noted that rehabilitation can be funded by external aid flows or grants. (Benson & Clay 2004, 23.)

To sum up, economic impacts are always case studies. There exist countless of factor affecting the final impacts; starting from the hazard itself and concluding to the external, public, private, social and other factors. Even though investigations are case studies, major impacts

can be drawn up. Impacts are studied to facilitate risk analysis and reduce the risks, also to be able to do cost-benefit or investment analysis. They exist in order to help economies to reduce the consequences of natural hazards. All in all, the studies can improve certain policy changes and institutional innovations. They can reduce economic vulnerability and support economic growth and development. (Benson & Clay 2004, 28.)

### 3.2.6 Impact on Tourism

The investigations Benson and Clay (2004) did in Dominica, shows significant impact on tourism. During the past 20 years, tourism had become essential for the island's economy. Clear relation between natural hazards and tourism cannot be drawn due to the several other factors affecting tourism. Anyhow, it was shown, that level of tourism was affected by Hurricane David halting it for several years after the hazard. Extreme hazards, like hurricanes, volcano eruptions and earthquakes are jeopardising the possibility of making insurance coverage and investment funding. Dominica invested in for example measuring the cruise ship facilities, which positively supported the growth and reducing vulnerability afterwards. (Benson & Clay 2004, 72.)

Uncertainty has been a problem, when it is attacked by such an extreme hazards as Hurricane David. Benson and Clay claimed that the problem with uncertainty is usually higher the more business are owned by sole proprietorships and partnerships. In the case of Dominica, the growth in cruise ship business was considered to bring more sensitivity in terms of hazards. (Benson & Clay 2004, 72.)

### 3.2.7 Impacts of Natural Hazards in the Case of Dominica

Substantial uncertainty and unpredictability are often linked with natural hazards. Hazards do not follow certain patterns and thus they can cause unexpected damages or be followed by sequence of events afterwards. Risks have to be reappraised regularly. Economic situation is continuously changing, which reflects to changes in the levels of development and capital investments, also structures and arrangements of economic activity. Planning and integrating

the medium- and long-term economic and financial analysis can reduce the vulnerability to natural hazards and also maintain consistent growth in economy. (Benson & Clay 2004, 77.)

Decisions aiming rapid recovery and reducing long-term vulnerability are significant to determine the final economic consequences. It is important to emphasise on integrating medium- and long-term economic and financial planning. (Benson & Clay 2004, 77.)

Urgent actions for information, monitoring, assessment, mapping and dissemination are needed rapidly after the disaster. Clear and easily accessible information is needed for the public. Benson and Clay also pointed out that recognising the structure and characteristics of a small island is important for mitigation. It is significant to strengthen the key infrastructure and foster the less vulnerable areas in an economy. These will help to ensure long-term economic growth and reduce vulnerability for possible future natural hazards. (Benson & Clay 2004, 77.)

### 3.2.8 Relation between Income and Damage Caused by Natural Disaster

To begin with, it is obvious that as country develops, also the country's preparedness towards safety improves. Toya's and Skidmore (2005) studied the relation between income and damages caused by a natural disaster. A clear evident of the fact that less developed and low income countries are more vulnerable to natural hazards and more losses and deaths occur was not found. However, they drew up conclusions were the impacts of natural disaster can be prevented by variety of actions made by private entities, governmental and not-for-profit organizations. (Toya & Skidmore 2005.)

Toya and Skidmore concluded that it is more feasible for more developed countries to build up systems in disaster prone areas for warnings, forecasting, planning, building, codes and etc. Furthermore, they concluded that it might be impossible for nations and low-income individuals to employ precautionary measures. (Toya & Skidmore 2005.)

Toya and Skidmore gave suggestions, based on their research, how improve the level of safety and thus reduce the disaster deaths and damages:

- Income and social/economic fabric

- higher educational attainment
- greater openness
- a well-developed financial sector
- s smaller government
- more direct mitigation efforts
- long-run disaster reduction policies to:
  - improve education
  - increase openness
  - further development in financial markets

The main features their suggestions gave were to improve the networking in the society, educate the civilization, cultivate the financial sector and generate the openness. The education is valuable when considering the impacts of natural disasters. Being open towards the awareness, educational purposes, and also for foreign investors is an important factor. A financial sector should be well-developed in order to be stronger towards natural disasters. Mitigation efforts are important to develop. These refer to efficient evacuation and rescue actions. (Toya & Skidmore 2005.)

### 3.3 Redevelopment after a Natural Disaster

Redevelopment after a natural disaster based on L'Aquila earthquake in Italy and Hurricane Katrina in United States.

Margherita Mori explained in her seminar (2010) about the effects of natural disasters, the importance of studying them and especially the redevelopment after a disaster. One significant issue is that the awareness of natural hazards should be brought into public awareness. When it is time for redevelopment after a disaster, the priorities focus on identifying the

process, the policies and procedures in order to continue technology infrastructure critical to any organisation. (Mori, 2010.)

A planning approach for disaster-readiness encompasses a crucial task either for maintaining or quick action to resume the most relevant activities. The formal process of continuity plan consists of analysis, solution, design, implementation, testing/acceptance and maintaining. The redevelopment process would prove much easier and absorb much less of the resources should the negative impacts of a natural disaster be mitigated by adequate planning. (Mori, 2010.)

Mori also explained about the lessons learned of how survived people recover from natural disasters. Through a careful study of what happened in Louisiana and especially in New Orleans after Hurricane Katrina, lot of disaster related products were made, for example a graphic novel of the storm in New Orleans or found objects were recycled to make art works. Their popularity was surprisingly good as the increased sales in these products showed. This also led to an increase in an amount of tourists visiting the place, as it was called a “patriotic lure”. The study also revealed that people always seek ways to reaffirm their shaken sense of self, especially after a disaster. (Mori, 2010.)

Pre-condition for the rebirth of affected areas is to learn from experiences and turn the lessons into long-term growth. Key investment areas must be recognised and met with health care, economic development, housing opportunities, neighbourhood renewal, enhancing public assets and infrastructure. Mori (2010) emphasised on the economic development of public and private partnership, which can eventually help to take advantage of government resources, private sector investment, effective laws and policies, economic research and expertise. Through coordination, cooperation and information sharing among private sector, government, residents and all groups of societies can ensure effective results of recovery. (Mori, 2010.)

### 3.4 Volcanoes

“Volcanic hazards are natural phenomena that will occur no matter what humans do”. They can cause hazards, such as lava flows and floods. These are risks for people living in the vi-

cinity areas of volcanoes. Nothing can be done to prevent volcanic hazards, but volcanologists study those to prevent risks. (Mori, 2010.)

#### 3.4.1 Subglacial Eruptions

10% of Iceland is covered by glaciers, which hide several active volcanoes. The concentration and frequency of subglacial eruptions is greatest in there. Antarctica is another place these types of eruptions might occur. Volcanoes erupting under the snow or ice generate unique features and hazards. The hazardous consequences occur when lava interfaces the ice or snow. Cooling lava may produce ten times more melting water which is dangerous for the populated lands down slope in immediate areas. (Lockwood & Hazlett. 2010, 371, 372.)

Under the large glacier, Vatnajökull, lies active volcano, Grímsvötn. This volcano's last eruption was constantly monitored. Especially the warm-water lake, which was situated above the Grímsvötn magma chamber, was carefully monitored due to its hazardous jökulhlaups (glacial lake outburst floods). Jökulhlaup damaged bridges, roads and powerlines with house-size blocks of ice. (Lockwood & Hazlett, 2010, 372.)

#### 3.4.2 Volcanic Ash Hazards to Aviation

Large amount of ash and aerosols can be flown into stratosphere by explosive eruptions and it can stay there for weeks and completely circle the globe. Volcanic ash was not major problem in aviation before the aircraft engines were developed. In addition to being danger to aircrafts and passengers, ash-producing eruptions can shut down airports for many days, disturb air traffic and damage ground facilities. Effective warning system has been developed in order to prevent danger. A few accidents caused by ash-producing eruption were recorded and thus around-the-clock observatories were organised to link air traffic centres, meteorologists and satellite monitoring agencies. Nine Volcanic Ash Advisory Centres (VAACs) were organised by the International Civil Aviation Organization (ICAO). These VAACs coordinate inputs of these agencies and run inflight warnings to threatened pilots in near real-time. This is highly important because explosive plumes can reach 9-11 km high altitudes at which

jets travel in only a few minutes, and can jeopardize hundreds of flight operations downwind of these volcanoes within a few hours. (Lockwood & Hazlett. 2010, 417.)

### 3.4.3 Volcano Eruption and the Probabilities

A statistical analysis of risks may not be reasonable during a volcano crisis. Volcanologists are doing their best to forecast based on long experience of volcanoes. The truth is that volcanoes can be never predicted. Anyhow, research has concluded to a probability trees or probabilistic event trees, which diagrammatically assign informal probabilities of future events. A restless volcano can result with the probability of 65% to a volcano eruption, and the rest is for the non-eruption. With an 80% probability, volcano eruption leads to an explosive eruption type, and 20 % for effusive eruption. If it is explosive, with an 80% probability, tephra fall will occur. The direction of the wind is towards east with the probability of 45 %, and to south with 35 %. (Lockwood & Hazlett. 2010, 430.)

### 3.5 Actions of Security in Tourism Sector after the tsunami in 2004

In 26<sup>th</sup> of December in 2004, a strong earthquake occurred in the Indian Ocean causing a vast vent under the sea. The current evacuation and warning system, which might have facilitated better rescue operations, did not exist yet. It has been said that the existence of the warning system could have saved lives. The experiences from the tsunami led to a development of the technology. Now seismic activity is measured with the network of units in the sea. It follows the earthquakes and the level of the sea and its fluctuations. Not every earthquake causes tsunami so the sea level measurement system is essential in order to be aware of the waves. Should the wave front escape fast and radiantly away from the unit, the unit will give the warning. Technology is developed constantly so that the tsunami could be recognized also by the pressure and even from the surface of the sea. First units were built in the Pacific Ocean and Indian Ocean, which have the most frequent earthquakes. Later on the Caribbean Sea, Mediterranean and North- East- Atlantic Ocean will be built with a similar warning system. (Lindroth & Valtanen 2010, 27.)

Plans for security were prioritized after the most urgent matters. The security in the tsunami-prone areas were developed, the locals, tourists and students had to be informed about the facts of natural disaster and safety plans and the economy in the affected areas had to get back to business. The tourism related businesses got support from the government. For example taxes were reduced and cheaper loans were offered. To ensure the security around these areas, the number of employees at the coast and in the sea tourism was increased. A lot of importance was given for the information technology. After the tsunami in Thailand, the use of internet and mobile phones was worthy for the rescue teams, tourists and information delivery. (Lindroth & Valtanen 2010, 27.)

After the earthquake and tsunami in March 2011 Japan was injured severely by the aftermath consequences. The magnitude of the earthquake was 8,9, and it caused tsunami wave, flooding, landslides, fires, building and infrastructure damage, nuclear incidents including radiation releases. (Guardian UK. 2011.)

### 3.6 Tourism Emergence Response Network

In 2006, the leading tourism associations formed association called TERN (The Tourism Emergence Response Network) in order to ensure closer cooperation and collaboration between the decision makers and biggest units of tourism industry. It is also grouped to avoid the damages in the tourism industry in case of emergency by ensuring fluent flow of information. After the recent incidents which had remarkable effect on the industry, the current established systems were now seen fragile. The system needed development in case of unforeseen and unpredictable events. (WTO, 2011.)

The main features of TERN are to have close cooperation with United Nations System Influenza coordinator, the WHO and other involved UN agencies, share and deliver real time information and ideas, share concise, clear and geographically specific data to public and be activated for regional or global emergencies. (WTO, 2011.)



## 4 TOURISM IN ICELAND

This remotely located North Atlantic island is populated by 318 452 inhabitants (1.1.2011, Statistics Iceland). Iceland has been very little known destination in Europe. Statistics of Iceland shows tremendous growth in tourism in recent years' figures. Within the years 1995-2000, international tourists' arrivals have grown 11.7 % per year. When this percentage is converted into absolute numbers, arrivals increased from 142 000 in 1990 to 278 000 (in 2002), whereas from 2003 to 2007 international passenger numbers (including transit, business and leisure related travel) grew by 49%. (Gössling & Hultman 2006, 53, Statistics Iceland 2010.)

Iceland has taken advantage of technology when using the nature-based tourism as a source of economy. Hiking paths, national parks and other destinations have been facilitated with accessible roads, walking paths, huts, sometimes even restaurants and hostels. Thus it is more accessible for more tourists, subsequently for mass tourism.

### 4.1 Economy in Iceland

The importance of fishing industry for the Icelandic economy has decreased to some extent. In the meanwhile the industrial products have increased their value for the economy. E.g. aluminium products, fishing gear, the machinery used in the fishing feeding processes, packaging products for the groceries as well as pharmaceutical industry products and information technology have improved their value for the economy. (The Embassy of Finland. 2010.)

Tourism is one of the fastest growing sources of income in Iceland, and it is the third biggest currency importer. Newish segments of tourism are whale watching tours and ecotourism. The amount of annual incoming tourists reaches almost up to 450 000. The amount has tremendously grown during the past ten years. Majority of the tourists come from the South and Central Europe, Nordic countries, North-America and Great Britain. (Embassy of Finland. 2010.)

The allocation of the Icelandic workforce is clear. Majority of the workforce is focused on service sector (73,4%). Remarkable amount works in industrial sector (20,2%) and the rest is

for agriculture- and fishing industry (5,9%). Unemployment has been comparably slow in Iceland within the past year. The economic crisis had a negative impact to the employment figures in Iceland. While it was still 2,3 % in 2007, it grew immensely to 7,6 % in 2010. Such a rate is high for a small state as Iceland. (Statistics of Iceland. 2010.)

Energy is a remarkable natural resource in Iceland. Due to its geothermal soil, Iceland is a self-sustained energy country. The usage of the usable energy is only 20-25 per cent, because domestic demand for energy is comparably low and exporting energy is not profitable. Iceland sees it as an opportunity to add energy consuming factories. East-Iceland is building up new aluminium factories. Exports increased by 15,2 % from the previous year, whereas imports grew by 9,2%. (Embassy of Finland. 2010.)

The biggest exports from Iceland are marine products, manufacturing products, aluminium, ferro-silicon and medicine products. Iceland imports foods and beverages, industrial suppliers, processed products and capital goods (excluding transportation). (Statice Iceland. 2011.)

Tourism is the second most important source of economy right after fishing industry. In the fall of 2008 Iceland was hit by the economic crisis, "*kreppa*". Iceland has comparatively small central bank, which could not alleviate high consumer debt and a slowdown in spending. The central bank was also unable to implement policies before and during the crisis happened. This affected negatively on Iceland's currency which lost approximately 40 % of its value in 2008. The devaluation of their currency concluded in a positive way to Iceland's in-bound tourism. It is seen more accessible tourist destination worldwide; especially many of the North American and South/ Central European tourists caused an influx to Iceland. This influx has kept the Icelandic travel and tourism industry afloat during the difficult economic crisis time. (Euromonitor International 2011.)

## Kreppa

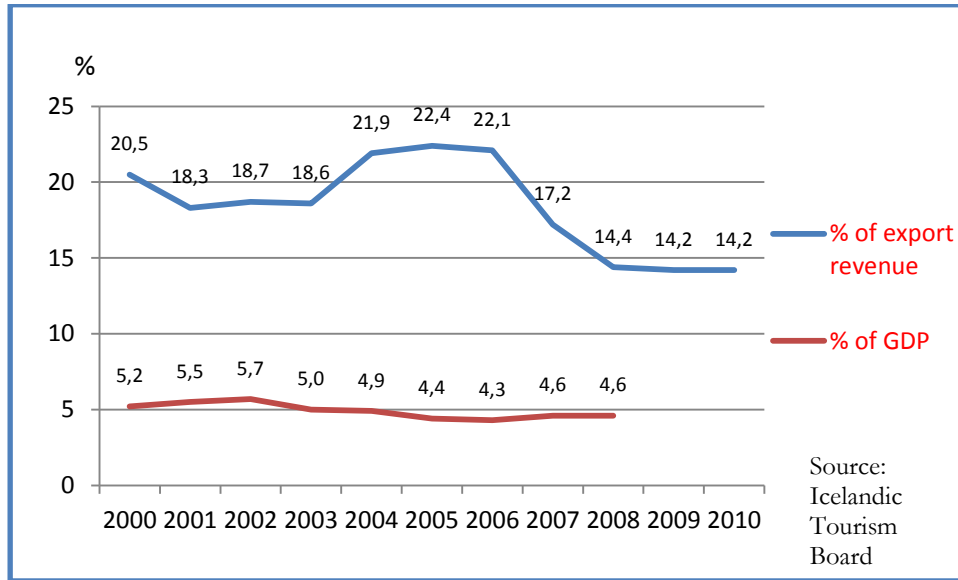
Iceland was drifted into economic crisis in the fall of 2008. The biggest banks, Landsbankinn, Kaupþing and Glitnir lost their ability to pay back the loans and the biggest foreign investors required to get back their receivables. The great amount of loans taken by households led to inflation and the increase in the prices. The inflation was at 18% at its worst instead of the aimed 2,5%. The Icelandic Central Bank tried to find solution to this by increasing the interests and thus luring the foreign investors. Finally the bubble of currency explod-

ed and the value of the Icelandic króna decreased. It has been said that usually the Central Banks of the states can ease the situation, but Icelandic Central Bank was not able to pay back the loans as they were large amounts. In September 2008, the short-term foreign loans together with British investments were four times bigger than the currency resources of Icelandic Central Bank. (Benediktsdóttir, Gunnarsson & Hreinsson 2010, 91-94.)

Landsbankinn, Kaupthing and Glitnir were considered as trash banks, and now they are replaced by Íslandsbanki (former Glitnir), Nýja Kaupþing and Nýi Landspáki. Especially the private investors had been investing in Iceland. Due to the crash of the Icelandic banks, the relations between the United Kingdom and Iceland have been colder than before. After negotiations, International Monetary Fund collected for about ten billions of financial aid. They have made an action plan to develop the functions of Icelandic banks. (Benediktsdóttir, Gunnarsson & Hreinsson 2010, 91-94.)

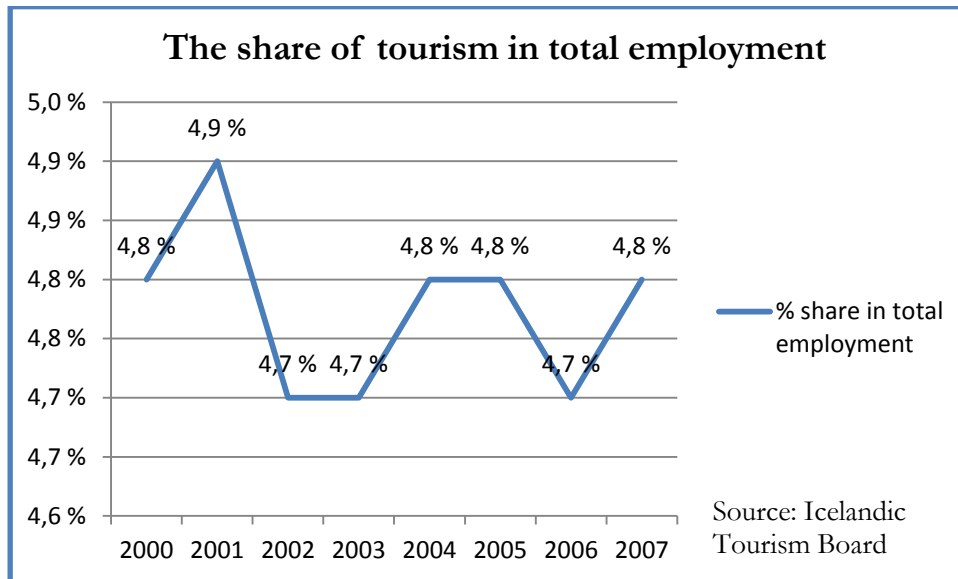
## 4.2 Statistics and the Impact of Inbound Tourism in Iceland

Figure 4. The share of tourism in Iceland's GDP and the share in total export revenue (Icelandic Tourism Board, 2011.)



According to the statistics of Iceland's Tourism Board (2011) the share of the tourism in Iceland's GDP between 2000-2010 was, on the average, 4,9 %. It was on the highest in 2002 (5,7%) and the lowest in 2006 (4,3%). The percentage was rather stable between these years. Tourism has an impact on the employment rates. The share of tourism in total export revenues was 14,2 % in 2010. Between the years 2000 and 2010 it was 22,4 % at the highest. From 2006 to 2008 the percentage of the tourism share of the export revenue decreased heavily; it dropped from 22,1% to 14,4 %. Tourism had been the second most important export revenue resource until 2006 when aluminium and ferrosilicon exports exceeded the share of tourism exports. (Ministry of Industry, Energy and Tourism, Publications, 2010.)

Figure 5. The share of tourism in total employment. (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)



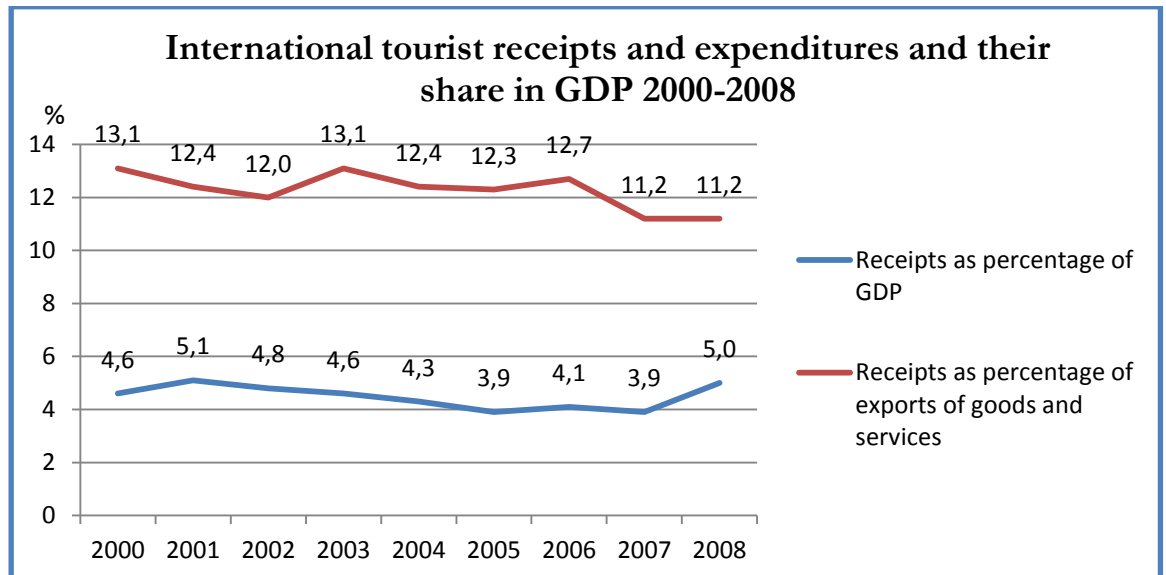
Between the years 2000-2007 the share in total employment in tourism related industries fluctuated from 4,7 % to over 4,9%. In loose numbers, the amount of jobs was in 2000 over 7000. It had been slightly increasing since 2002 and finally in 2007 the amount of jobs was approximately 8300, which undoubtedly is a significant number to this small economy. Jobs are allocated in the tourism industry to characteristics and connected tourism industries. Characteristics tourism industries are accommodation and catering services, passenger transfer services and travel agency occupations. The jobs in connected tourism industry are in retail sales, entertainment, shops, culture, recreational activities and services in connection with passenger transport. (Statistics 2011.)

According to the Statistics Iceland the number of registered enterprises and organisations between the years 2008 and 2010 did not have a significant increase. In the accommodation field (hotels and similar accommodation, with and without restaurants, holiday and other short-stay accommodation, camping grounds, recreational vehicle parks and trailer parks and other accommodation) figure indicated a slight increase from the year 2008 until the end of 2010. (Statistics 2011.)

Other tourism related enterprises include passenger transport via land, water and air, event catering activities, food service activities and restaurants, travel agency, tour operator and

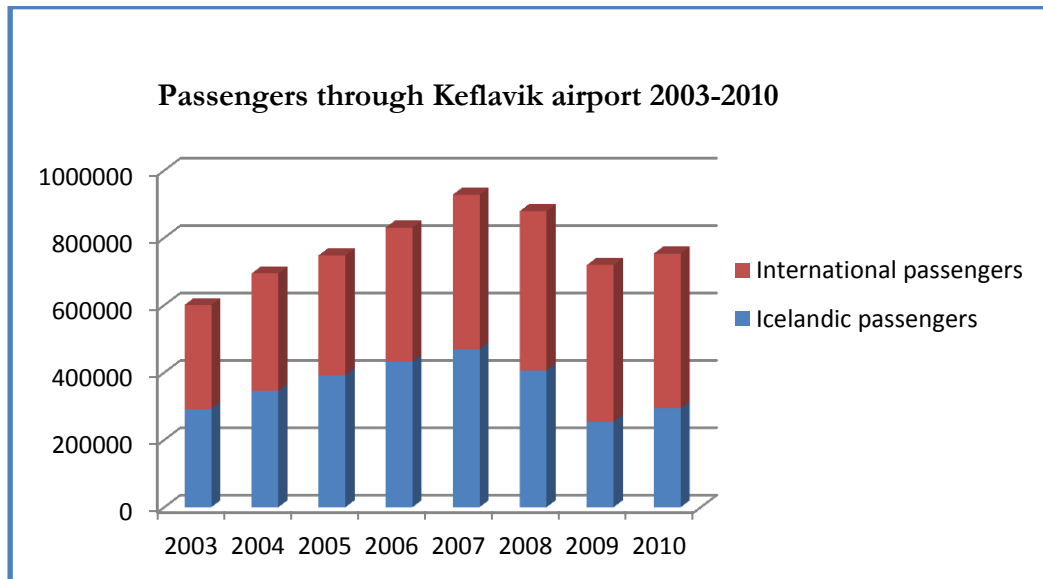
other reservation service and related activities. Every field indicates a slight increase almost without an exception. (Statistics 2011.)

Figure 6. International tourist receipts and expenditures and their share in GDP 2000-2008 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)



The foreign travel receipts and expenditures were measured. Purchases of goods and services were 51,3bn from the total amount and passenger fares were ISK 21,8bn. The consumption has gradually risen from the year 2000 until 2007. In 2008, the consumption increased immensely, while the value of the currency dropped. Nevertheless, the inbound tourism generates substantial income to the economy.

Figure 7. Visitors to Iceland 2003-2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)



There was a dropout from 2008 in the numbers of the passengers travelling through Keflavik airport. This amount separates international and Icelandic passenger, but does not reveal any other characteristic of the passenger. In addition to air routes, Iceland is reachable destination by sea. Approximately 95% of all the cruise ships that visit Iceland have a stopover in Reykjavik harbour. In 2008, the number of vessels visiting Iceland was 83 with just under 60 000 guests. (Statistic Iceland, 2011.)

Figure 8. Annual increase of visitors to Iceland (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)

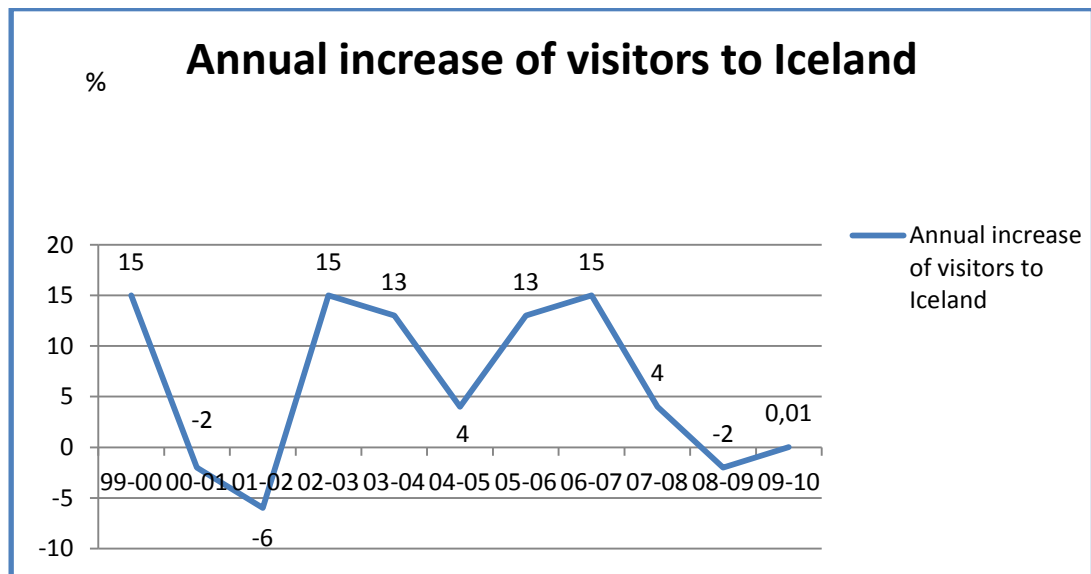
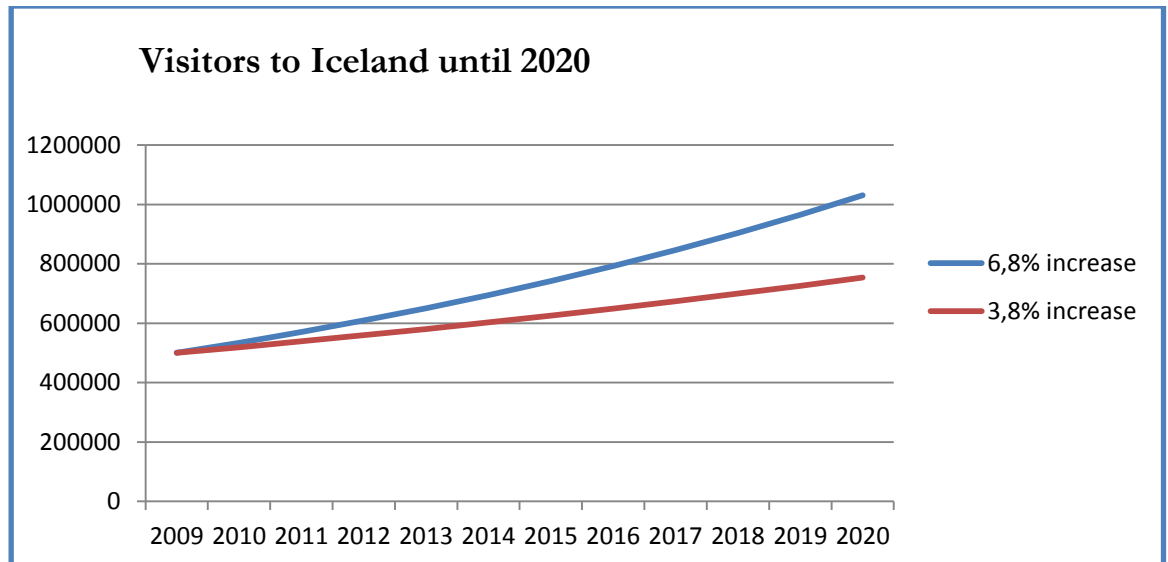


Figure 9. Visitors to Iceland until 2020 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)

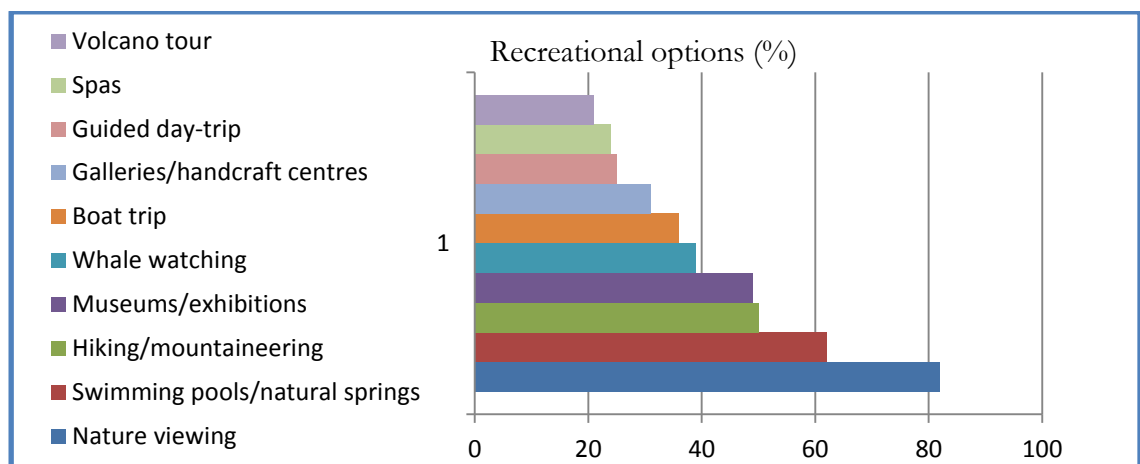


The Ministry of Tourism in Iceland also offers future prospects for the visitors in Iceland until 2020. During the past ten years, the annual growth has been fluctuating tremendously. However, the average annual increase of visitors has been for the past ten years 6,3%. If this is the case in next 9 years, Iceland will expect 1,2 million visitors in 2020. However, UN-WTO regards the increase of tourists globally. Should the annual increase be 3,8% as UN-WTO predicted, in 2020 the amount of visitors would be 760 000.



The highest season for tourism in Iceland is within June and August. January is the lowest in visits according to the survey of monthly departures through Keflavik Airport. The overnight stays in countryside and in the greater capital area fluctuate strongly between summer and winter time. During the summer months, 60% of the tourists spend the overnight stays in countryside, whereas in winter months, 80% is spent in the greater capital area. (Icelandic Tourism Board. 2011.)

Figure 10. Recreational options in 2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)



Without dispute, nature is the most popular means to travel to Iceland. According to the statistics gathered by Icelandic Tourism Board, swimming pools, natural springs and hiking and mountaineering follow right after nature viewing in popularity. The rest of the activities listed were nature or cultural activities. Notable in this survey is that a bit over 20% of the tourists included volcano tour in their activities.

#### 4.3 Transport to Iceland

Iceland is an isolated island in the middle of the Atlantic sea. Travelling to and from Iceland is conducted by very few possibilities, i.e. by air and sea. Thus the transportation is tremendously important, yet fragile factor when considering tourist arrivals and departures.

Keflavik occupies the only international airport in Iceland. Icelandair, Iceland Express and SAS are the three year-around passenger transporters of international flights of Iceland. In addition, there are 11 other airline carriers flying to Keflavik during the summer season. Di-

rect flights to Keflavik airport fly from United Kingdom, France, United States, Canada, Germany, Netherlands, Belgium, Spain, Greenland, Denmark, Sweden, Norway and Finland. (Keflavik airport, 2011.)

Travelling to Iceland through sea is not as common as flying. Anyhow, there are a few possibilities to sail to Iceland from the US or Europe. For instance Samskip and Eimskip offer passenger cabin in their freight ships. Nörröna offers a ferry which sails between the countries of northern Europe. Seydisfjordur, located in the Eastern Iceland, serves as the cruise- and car-ferry seaport. Smyril Line travels to Seydisfjordur from Denmark, Faroe Islands and Norway. (Visit Iceland, 2011.)

#### 4.4 Civil Protection in Iceland

Under the Icelandic Ministry of Interior works a Department of Civil Protection. Its tasks are to protect the wellbeing and safety of the public by implementing measures, prevent and reduce possible hazards, and finally prepare and implement a recovery process. The Civil Protection also protects the property and the environment from natural or manmade disasters, pandemics, military action or other types of disasters. (Almannavarnir, 2011.)

The Civil Protection also works to render and assist if any losses have occurred. People are given assist in case of emergency by this authority unless the responsibility for his assistance lies with some other authority or organisation. The functions of the Department of Civil Protection in daily basis include risk analysis, mitigation and co-ordination (which include planning, training and preparing equipment. (Almannavarnir, 2011.)

## 5 EYJAFJALLAJÖKULL

### 5.1 What Happened?

The Eyjafjallajökull eruption of 2010 began in the early spring with the onset of groups of small earthquakes in southern Iceland. By early March the intensity and frequency increased in the earthquake activity. On March 21<sup>st</sup>, fountains of lava began to exit through a 500-metre-long vent in the ice-free Fimmvörðuháls pass, which separates the Eyjafjallajökull glacier from the larger glacier Mýrdalsjökull to the east. Volcano eruption did not cause any damage to the physical property. (Almannavarnir, 2010.)

Intensifying smokes from the swift vaporization of ice started a series of moderate phreatomagmatic explosions (which result from the contact of magma and water) that plume a cloud of steam and ash rose almost as high as 11 km into the atmosphere. Ash also rose in a granular form which usually falls immediately and then lies on the ground. People in affected areas were advised to cover their face with a cloth or use a mask. (Almannavarnir, 2010.)

On April 14<sup>th</sup>, eruption caused a new fissure surfaced beneath the crater of the glacier-covered summit. Glacier ice started quickly melting because the heat from the lava vaporized underneath the glacier. Mud, ice, and melt water running off the volcano expanded local rivers and streams, particularly the Markarfljót glacial river west of the volcano, which flooded farmland and damaged roads and bridges. (Almannavarnir, 2010.)

On April 15<sup>th</sup>, the Department of Civil Protection and Emergency Management ordered an immediate evacuation of the area. There was an imminent and immediate danger of flash flooding. A sign of large amount of water was seen emerging from under Gígjökull. Inhabitants are evacuated to the higher ground or safe areas. The National route 1 was closed due to the cut of the bridge over Markarfljót (river) and the poor visibility caused by the volcanic ash fall. Around 800 people were forced to leave their homes. (Almannavarnir, 2010.)

On 17<sup>th</sup> April, the Civil Protection Authorities restricted the Eyjafjallajökull glacier and the foothills around the area from the public. Heavy ash fall and thunderbolts created hazardous conditions around the area.

Over a hundred of volunteers from the Icelandic Red Cross, ICE-SAR (Accident Prevention Association), Jeep Club 4x4 and member from a group created on Facebook took part in restoration work in the farms around the Eyjafjallajökull region by cleaning and helping with farming tasks. The Fire Protection Services of Arnessýsla participated also in the work. (Almannavarnir 2010.)

London VAAC (Volcanic Ash Advisory Centres) made measurements of the distribution models of ash. These models were available on the website of Volcanic Ash Advisory. The Red Cross opened temporarily mass emergency reception centres in Vík í Mýrdal and Kirkjuæjarklaustur. There was an active information centre in Heimaland. Lectures were given by the Directorate of Health and Landspítali hospital. (Almannavarnir, 2010.)

In December 2010, the alert level for the Eyjafjallajökull was lowered and reduced to uncertainty phase from distress phase. Volcanic activity had been diminished totally since June, 2010. According to the scientists, a new eruption would have a distinct warning period. The uncertainty phase is the lowest level of the 3 alert levels. The Eyjafjallajökull was still closely monitored by scientists and Civil Protection authorities. The glacier above the volcano and the highlands up around the volcano is still covered with tremendous amount of ash. (Almannavarnir, 2010.)

The probabilities presented in the chapter 3.4.3 indicate the truthiness of mentioned probabilities in case if the volcano in Iceland. The latter part of the volcano eruption led to an explosive eruption type. A tephra fall occurred. The direction of the wind blew towards south and east as it is most likely to happen according to Lockwood and Hazlett (2010).

When the eruption started in March, it attracted a huge number of tourists to the area and the local authorities investigated ways to facilitate the access to the area. Different operators in Icelandic travel industry organized tours to the erupting area, glacier and other surroundings with jeeps, helicopters, hiking groups and snow mobile safaris. By 24 of April, Almannavarnir estimated that around 100 000 people had visited the volcano since the volcano started erupting. A significant amount was foreign tourists. From this amount, 2 local visitors died of hypothermia when they became stranded during their visit to the volcano. (Almannavarnir 2010.)

## 5.2 Disruption in Aviation

The volcano had a heavy effect on the aviation. Flying restrictions were coordinated over the south of Iceland. During April 15th, ash fall affected flights in the Great Britain, Norway, Sweden, Finland, Denmark and Russia. Flights over the Atlantic was the ash-prone area, thus the flight paths were adjusted in a southerly direction to avoid the prone area. (Almannavarnir, 2010.)

The plume which rose from the erupting volcano was driven southeast, across the North Atlantic Ocean to northern Europe, by the prevailing winds. Fearing the damage to commercial aircraft and potential loss of life that could result from flying through the ash cloud, many European countries closed their national airspace and grounded flights for several days. This caused costly impact on their functions. Airlines generally rely on a carefully-planned sequence of flights. Should the sequence be broken, it is very hard to catch up according to John Strickland from JLS Consulting. (Almannavarnir, 2010)

## 5.3 The Effect on Agriculture in Iceland

Evacuation had been carried out during the eruption, thus around 700 were ordered to leave their homes in the beginning of the eruption. Part of the evacuated people was allowed to go back to their homes to feed their animals and milk the cows. The local authorities were given reports whenever these people came back from the area. 12 % of the dairy production, 17% of all the horses in Iceland and about 6 % of the sheep production is situated in the vicinity of the eruption area. About 120 farms were affected because of the ash which rose from the volcano. (The Agricultural Association of South Iceland 2010.)

The local authorities, the Agricultural Association of South Iceland and also the Farmers Association of Iceland worked together with the farmers to evaluate the situation in the farms. A land for sheep grazing was provided and parts of the sheep and horse herds were transported to other grazing areas. 2 or 3 farms are about to stop their farming because of the ash. The local authorities suggest that it will take a few years until the area is settled. (The Agricultural Association of South Iceland 2010.)

#### 5.4 Activity by Icelandic Authorities

Iceland was actively aiming to improve the tourism flow to Iceland after the volcano eruption. Inspired by Iceland was organized by the cooperation of the Ministry of Tourism, Industry and Energy, Icelandair and Iceland Express airlines, Reykjavik city, the Export Council and the Iceland Tour Operators' Association. It was an ambitious marketing campaign, which started to run from mid-May 2010 in order to deliver the safer picture of Iceland. This marketing campaign enabled public to bring their opinion about Iceland and thus market the place.

Inspired by Iceland marketing campaign has their website ([www.inspiredbyiceland.com](http://www.inspiredbyiceland.com)), which publishes stories, videos, pictures and live stream webcams of Reykjavik, Geysir area and Blue Lagoon. This campaign organised also a concert with popular artists, and the concert was broadcasted also in their website through live webcams.

Icelandic government organised an intensive Iceland Hour which purpose was to increase the awareness of the safety in Iceland. The public worked to tell their friends abroad, that Iceland is worth of visit. Icelandic phone operator Siminn also participated to the campaign by providing free calls to abroad. This campaign was also meant to increase the awareness of foreigners about the worth-visiting Iceland.

## 6 RESULTS

This chapter shows the inbound tourism to Iceland the change in the number in comparison to the previous years. The number of passengers is allocated into countries, market areas and by point of entry. In addition to these, the annual number of passengers is allocated into months, when it is easier to compare the years and the change. Finally, the number will be compared to the total number of passengers including Icelanders and comparison also to the inbound tourism to Finland in the summer of 2010.

Table 1. International visitors through Keflavik airport 2008-2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)

*by nationality*

	Number of visitors			Increase/decrease (%)		
	2008	2009	2010	07/08	08/09	09/10
Canada	10568	11063	13447	67,9	4,7	21,5
Denmark	41026	40270	38139	-0,9	-1,8	-5,3
Finland	10797	11566	11012	9,3	7,1	-4,8
France	26161	28818	29255	15,4	10,2	1,5
Germany	45120	51879	54377	11,3	15	4,8
Italy	10116	12645	9692	-3,4	25	-23,4
Japan	6732	7048	5580	10,4	4,7	-20,8
Netherlands	18756	19262	17281	30,2	2,7	-10,3
Norway	35122	36485	35662	1	3,9	-2,3
Spain	10438	13771	12237	10,4	31,9	-11,1
Sweden	32259	31421	27944	-3,3	-2,6	-11,1
Switzerland	7136	8646	9163	3,3	21,2	6
United Kingdom	69982	61619	60326	-4,6	-12	-2,1
USA	40495	43909	51166	-22	8,4	16,5
Other	107964	86134	83971	10,8	-20,2	-2,5
Total	472672	464536	459252	3	-1,7	-1,1

*by market area*

	Number of visitors			Increase/decrease (%)		
	2008	2009	2010	07/08	08/09	09/10
Nordic countries	119204	119742	112757	-0,2	0,5	-5,8
United Kingdom	69982	61619	60326	-4,7	-12	-2,1
Central/S-Europe	117727	135021	132005	12,7	14,7	-2,2
N-America	51063	54972	64613	-12,3	7,7	17,5
Other	114698	93182	89551	10,7	-18,8	-3,9
Total	472674	464536	459252	3,3	-1,7	-1,1

The tables above (Table 1) show the effect on the inbound tourism by the visitors through Keflavik airport. The number of passenger is allocated into countries (upper table) and consequently into market areas (lower table). Icelandic Tourism Board defines Iceland's market areas as Nordic countries, Central / South Europe, North America and other. Nordic countries belonging to this market area are Norway, Sweden, Finland and Denmark. Central and South European countries are Germany, Austria, Switzerland, Belgium, Netherlands, Luxembourg, Italy, France, Spain and Greece. United Kingdom countries are England, Wales, Scotland and Ireland. North America includes United States, Canada and Mexico. Finally Eastern Europe, Africa, Asia, Australia and South America belong to the other countries.

When taking a look at the last column (increase/decrease (%)) at the last part of the table, a decrease in the inbound tourism can be seen. Only exception is the North-America, which has a 17,5% increase in their inbound tourism to Iceland, whereas in 2009 the number had increased only 7,7 %. The inbound tourism to Iceland from Nordic countries decreased 5,8 %. The number of passengers from United Kingdom has decreased during past three years. After 2009, the number of passengers dropped still 2,1 %. The number of North American passengers increased 17,5 %, whereas the number of other countries dropped 3,9 %.

The upper table (Table 1), where all the passengers are allocated to countries, shows the impact on the individual countries' tourism flow to Iceland. The number of passengers from Canada increased 21,5% and from USA 16,5%. The number of passengers from Switzerland increased 6 % and from Germany 4%. On the other hand, the number of passengers from Italy decreased 23,4 % and from Japan 20,8 %. Also Spanish (-11,1%) and Swedish (-11,1%) passengers' tourism flow had a decrease.



Table 4. Visitors through Seydisfjörður seaport 2008-2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)

*by market area*

	Number of visitors			Increase/decrease (%)		
	2008	2009	2010	07/08	08/09	09/10
Nordic countries	4681	3938	4867	-16,8	-15,9	23,6
United Kingdom	511	161	182	9,9	-68,5	13
Central/S-Europe	7515	8362	8686	0,4	11,3	3,9
N-America	38	26	39	-19,1	-31,6	50
Other	1656	1379	1726	-4,7	-16,7	25,2
Total	14401	13866	15500	-6,2	-3,7	11,8

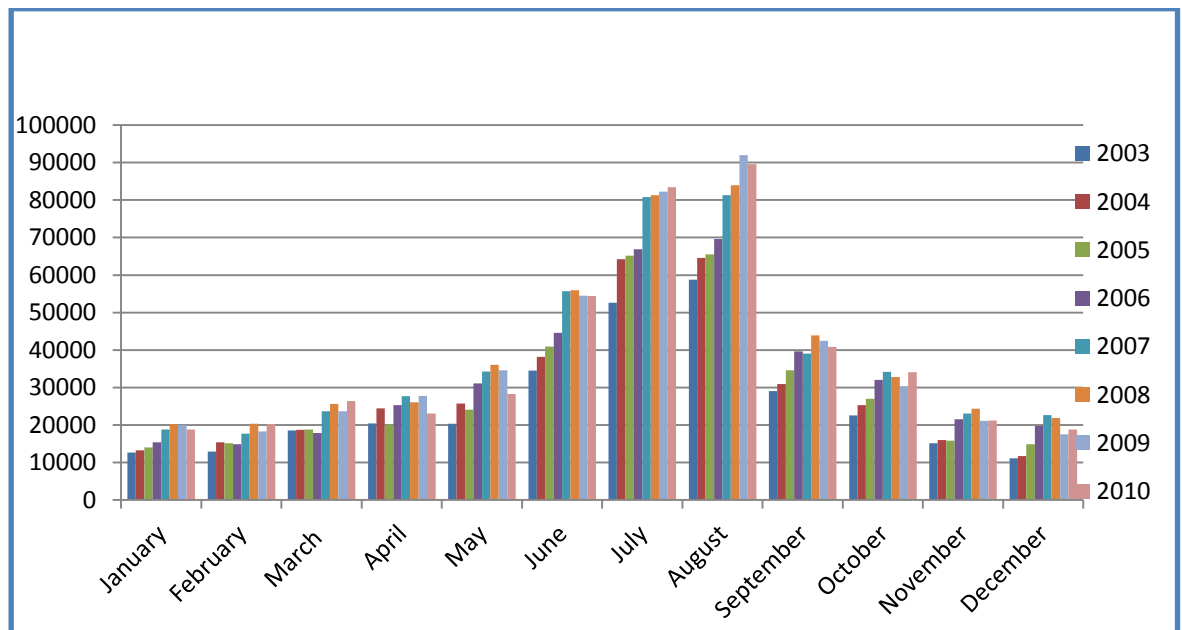
The upper table shows the change in the inbound tourism through Seydisfjörður seaport in 2008-2010. While the travel by sea had been decreasing in the past two years (from 2007 to 2009) it strongly increased after 2009. The annual growth decreased from 11,3% to 3,9 in Central / South European market area, but still the biggest number of travellers by sea come from this market area. They are followed by passengers from the Nordic countries, which account nearly half of the number of C/S-European passengers. The number of passengers from United Kingdom has decreased within past three years quite heavily. The number of passengers in 2010 from United Kingdom increased to 182, while it was still 161 in 2009. The number of North American passengers by sea is not remarkable. The number fluctuated from 38 passengers to 26 and back to 39 in 2010. Other passengers' number increased 25 % in comparison to the previous year, while it had decreased 16,7 % in 2009.

Table 3. International visitors by point of entry (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)

	2009	2010	increase/decrease	
			Number	Percentage(%)
			-	
Keflavik	464536	459252	5284	-1,15
Seydisfjörður	13866	15336	1470	9,59
Other airports	15539	20181	4642	23,00
Total	495950	496779	829	0,01

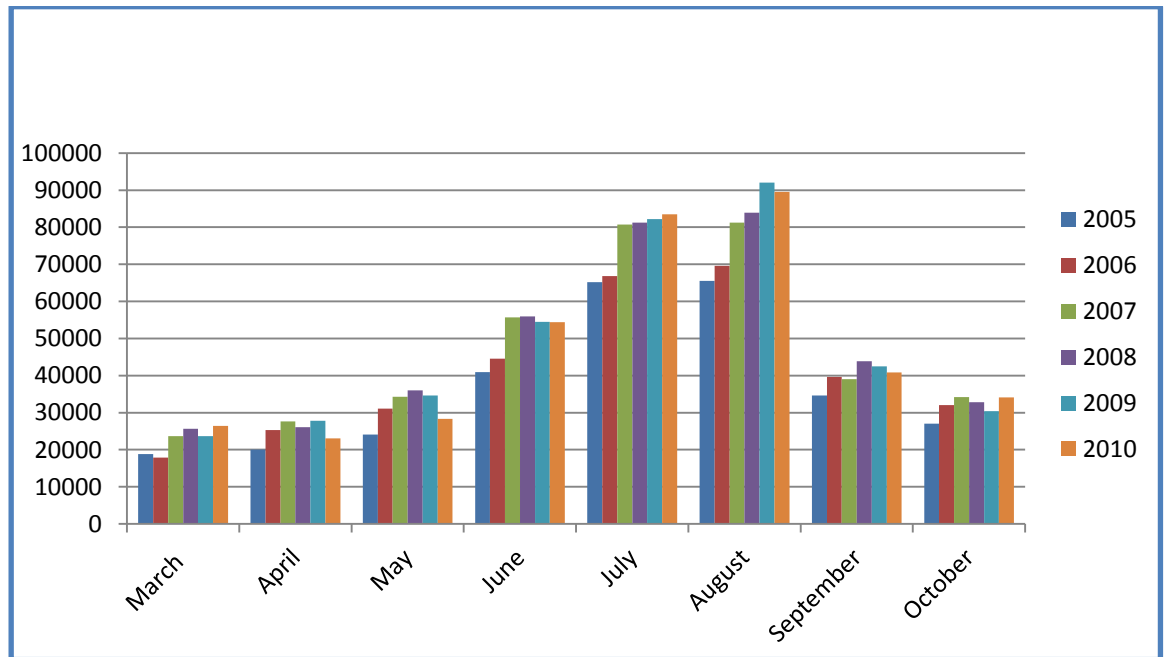
The table above divides the passenger into point of entries, which are Keflavik airport, Seydisfjörður seaport and other airports. During the April and May, Keflavik airport was closed for few days due to the ash. Other airports were temporarily opened for international flights, thus this table also includes the other airports in order to compare the numbers of visitors. The total number of international visitors who travelled through Keflavik airport diminished in 2010, whereas the number of passengers through Seydisfjörður and other airport increased in comparison to the previous year. The total number of inbound tourism in 2010 does not show any traces of increase nor decrease. The increase is 0,01 %, which is not a relevant number to draw conclusions.

Figure 11. The number of foreign visitors to Iceland 2003-2010 by months (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)



The figure above shows the inbound tourism to Iceland within the past eight years divided by months. A clear season months can be separated throughout the year. June, July and August are the most popular months Iceland is visited. The winter months (January, February, November and December) are the least popular months for visitors. The months April and May in 2010 show tremendous drop in comparison to the previous year 2009, even though the previous two months have had steady growth. The months after May had slight increase except for August and September in comparison to the previous year.

Figure 12. Passengers through Keflavik airport 2005-2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)



This closer figure presents the inbound tourism to Iceland within the past six years between March and October. This period starts from March over to the highest travelling season until October. In April, the more hazardous volcano eruption began. Here it can be seen more closely how the number of passengers in March was still higher in comparison to the previous year, when in April and May it decreased to some extent. This will be seen again with detailed information of the actual growth in the following figures.

Table 4. Inbound tourism to Iceland 2003-2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)

	2003	2004	2005	2006	2007	2008	2009	2010
January	12697	13265	14014	15377	18810	20289	19985	18782
February	12948	15424	15161	14899	17674	20312	18276	20293
March	18537	18742	18823	17882	23700	25619	23697	26399
April	20465	24448	20057	25308	27664	26085	27785	23087
May	20373	25746	24118	31075	34256	36024	34637	28298
June	34513	38164	40956	44591	55727	55978	54489	54391
July	52607	64275	65192	66872	80761	81267	82220	83465
August	58763	64534	65495	69587	81271	83967	92021	89558
September	29058	30900	34619	39628	39065	43907	42463	40863
October	22532	25338	27039	32077	34175	32826	30371	34069
November	15136	15960	15810	21560	23109	24376	21077	21240
December	11139	11737	14868	19769	22677	21885	17515	18807
Total	308768	348533	356152	398625	458889	472535	464536	459252

Table 5. The change in the number of inbound tourism 2004-2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)

	2004	2005	2006	2007	2008	2009	2010
January	4,28 %	5,34 %	8,86 %	18,25 %	7,29 %	-1,52 %	-6,41 %
February	16,05 %	-1,73 %	-1,76 %	15,70 %	12,99 %	-11,14 %	9,94 %
March	1,09 %	0,43 %	-5,26 %	24,55 %	7,49 %	-8,11 %	10,24 %
April	16,29 %	-21,89 %	20,75 %	8,52 %	-6,05 %	6,12 %	-20,35 %
May	20,87 %	-6,75 %	22,39 %	9,29 %	4,91 %	-4,00 %	-22,40 %
June	9,57 %	6,82 %	8,15 %	19,98 %	0,45 %	-2,73 %	-0,18 %
July	18,15 %	1,41 %	2,51 %	17,20 %	0,62 %	1,16 %	1,49 %
August	8,94 %	1,47 %	5,88 %	14,38 %	3,21 %	8,75 %	-2,75 %
September	5,96 %	10,74 %	12,64 %	-1,44 %	11,03 %	-3,40 %	-3,92 %
October	11,07 %	6,29 %	15,71 %	6,14 %	-4,11 %	-8,08 %	10,85 %
November	5,16 %	-0,95 %	26,67 %	6,70 %	5,20 %	-15,65 %	0,77 %
December	5,09 %	21,06 %	24,79 %	12,82 %	-3,62 %	-24,95 %	6,87 %
Total	11,41 %	2,14 %	10,65 %	13,13 %	2,89 %	-1,72 %	-1,15 %

In the figure above, the number of the all the passengers is compared to the number of the previous year's month. The painted grey area shows the months, which need a higher attention. The detailed monthly change percentages shows the target year (2010) and the comparison to the previous year in the same month. Now the accurate number can be seen in Table

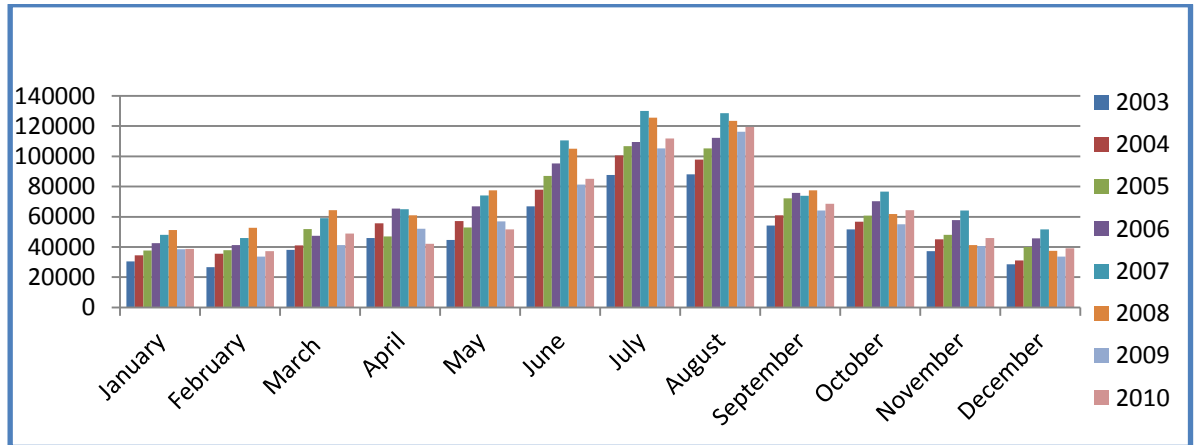
4 and the change in the Table 5. The change in the inbound tourism in 2010 in comparison to inbound tourism in 2009 was -1,15%. When observing the months separately starting from the beginning of the year, instability can be seen in the numbers. As already seen in the previous figures, April and May show tremendous decrease in the number of tourists. Still in March, the number of tourists increased by 10,24 %. The number of tourism increased by 10,85 % also in October.

The average annual growth in inbound tourism to Iceland between 2004 and 2010 is 5,34 %. When comparing the decrease in 2010 to the annual growth in the past ten years (6,8%), it shows rather heavy dropdown. Anyhow, it is higher than the annual growth presented by UWTO (3,8 %). Anyhow, it must be noted that the heavy decrease during April and May have great influence to the final growth percentage. Without taking into account the decrease in April and May, when the disruption in aviation was at its worse, the increase in the rest of the year (from June until December) is 1,88%.

Icelandic Tourism Board conducted a survey called Dear Visitors, which interviews the departing and arriving foreign visitors. According to the Icelandic Tourism Board's study, *Erlendir Ferðamenn á Íslandi sumarið 2010 og samanburður við sumrin á undan*, 9 % of the passengers who were about to travel to Iceland tried to cancel their trip after the Eyjafjallajökull eruption. Passengers from southern Europe and from the Benelux countries (12- 14%) had the highest cancellation rate of all the passengers. Among the Nordic Countries, 6 % of the passengers tried to cancel their trips to Iceland due to the Eyjafjallajökull eruption. Of individual countries, Spanish passengers feared the eruption the most of all the passengers; 23% of Spanish passengers tried to cancel their trips. 5% of the Norwegian and Danish passengers thought of cancelling their trips to Iceland. 4 % of the passengers travelling by ferry were about to cancel their trips. (Icelandic Tourism Board 2011.)

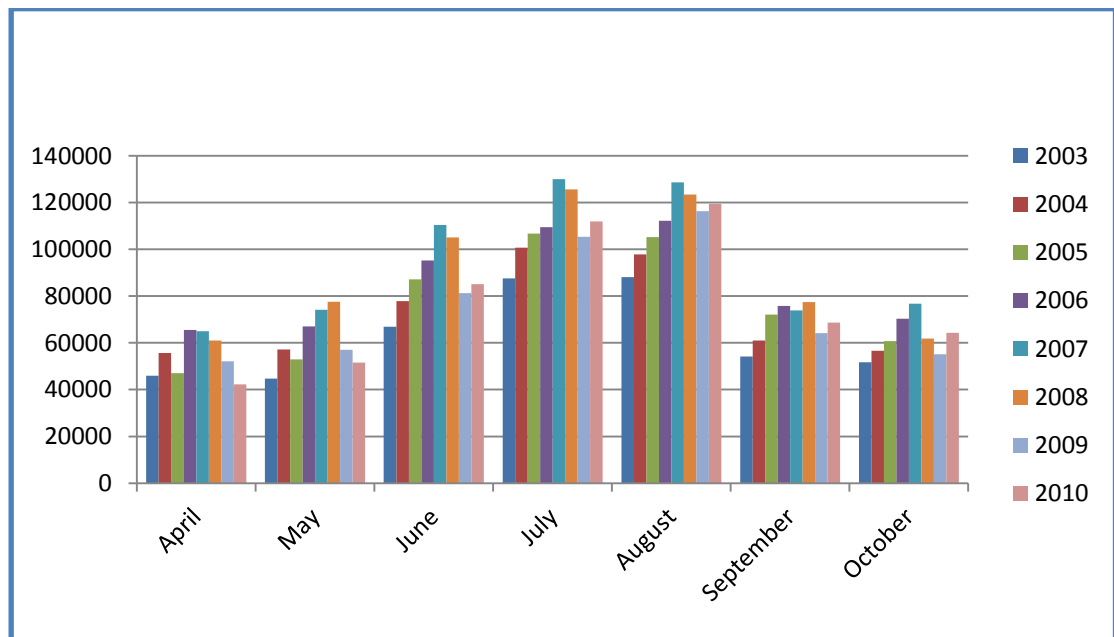
### 6.1 Comparison to the change of all the passengers

Figure 13. Passengers through Keflavik airport by month 2003-2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)



Upper figure shows the passengers through Keflavik airport by months from the year 2003 until 2010. From 2003 until 2008 there is a gradual increase in the number of passengers, but a visible drop after the year 2008 can be seen. The following figure shows the most popular months with a closer viewpoint.

Figure 14. Passengers through Keflavik airport 2003-2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)



The figure above is more detailed figure with the concentration on the specific period of time. It can be seen very clearly that the number of passengers going through Keflavik airport declined heavily in April 2010 which has been the case in earlier years as well. Still in May 2010 the number of passengers was smaller than the same number in May 2009, but the number changed from June onwards to be higher than the number of passengers in 2009. This can be seen throughout the rest of the year 2010 (in the upper figure).



Table 6. Passengers through Keflavik airport by month 2003-2010 (Icelandic Tourism Board, Tourism in Iceland in figures, 2011.)

	2003	2004	2005	2006	2007	2008	2009	2010
January	30556	34471	37747	42563	48056	51292	38551	38726
February	26738	35515	37780	41197	45923	52783	33531	37292
March	38177	40961	51840	47377	59051	64254	41306	48812
April	45955	55639	47074	65520	64920	60976	52155	42197
May	44693	57186	52953	66988	74202	77592	57043	51566
June	66846	77858	87127	95219	110496	105051	81252	85127
July	87639	100669	106708	109475	130072	125663	105344	111918
August	88150	97809	105284	112176	128628	123511	116373	119473
September	54228	60955	72143	75845	73869	77494	64151	68671
October	51657	56694	60733	70265	76724	61813	55129	64321
November	37281	45034	48064	57827	64052	41275	40598	45821
December	28449	31092	40081	45706	51696	37418	33640	39098
Total	600369	693883	747534	830158	927689	879122	719073	753022

Table 7. Annual change between the months in the amount of visitors going to Iceland

	2004	2005	2006	2007	2008	2009	2010
January	11,4 %	8,7 %	11,3 %	11,4 %	6,3 %	-33,0 %	0,5 %
February	24,7 %	6,0 %	8,3 %	10,3 %	13,0 %	-57,4 %	10,1 %
March	6,8 %	21,0 %	-9,4 %	19,8 %	8,1 %	-55,6 %	15,4 %
April	17,4 %	-18,2 %	28,2 %	-0,9 %	-6,5 %	-16,9 %	-23,6 %
May	21,8 %	-8,0 %	21,0 %	9,7 %	4,4 %	-36,0 %	-10,6 %
June	14,1 %	10,6 %	8,5 %	13,8 %	-5,2 %	-29,3 %	4,6 %
July	12,9 %	5,7 %	2,5 %	15,8 %	-3,5 %	-19,3 %	5,9 %
August	9,9 %	7,1 %	6,1 %	12,8 %	-4,1 %	-6,1 %	2,6 %
September	11,0 %	15,5 %	4,9 %	-2,7 %	4,7 %	-20,8 %	6,6 %
October	8,9 %	6,7 %	13,6 %	8,4 %	-24,1 %	-12,1 %	14,3 %
November	17,2 %	6,3 %	16,9 %	9,7 %	-55,2 %	-1,7 %	11,4 %
December	8,5 %	22,4 %	12,3 %	11,6 %	-38,2 %	-11,2 %	14,0 %
Total	13,5 %	7,2 %	10,0 %	10,5 %	-5,5 %	-22,3 %	4,5 %

In the figure above, the number of the all the passengers is compared to the number of the previous year's month. The painted grey area shows the months, which need a higher attention. Average percentage in the annual change between the years 2003 and 2010 is 2,5 %. When comparing the average annual change in the number of passengers to the annual change, the drop after 2008 is very significant. The detailed monthly change percentages

shows the target year (2010) and the comparison to the previous year. After the June 2010 there is a significant increase in the percentage of the change in the passenger numbers as have been seen already in the previous figures.

In March 2010, there is an increase of 15 % in the table 7. In April 2010, there is a significant decrease in the growth, i.e. 23,6 % less tourists when comparing to the previous year. In May 2010 there still is a decrease in the number of passengers. Even though both April and May have a decrease in their passengers numbers, still the total number of passengers in the year 2010 indicates 4,5% increase. When comparing this percentage to the -1,15% decrease in inbound tourism excluding the residents of Iceland, a growth in a tourism flow can be seen with these passengers. In addition, the tourism flow to Iceland by all the passengers increased fast after the volcano eruption, whereas the percentage excluding the residents of Iceland increased rather slowly during the rest of the year 2010.

## 6.2 Comparison to Finland

Referring to the border interview made by Tilastokeskus Finland and Matkailun edistämiskeskus, the inbound travelling to Finland increased in the summer 2010 in comparison to the previous year. Tilastokeskus has made a border interview. The summer season lasts from May until the end of October. Finland was visited by 3,6 millions of foreign visitors in the summer of 2010. The amount of visitors grew by 5 % in comparison to the previous year. Foreign visitors brought all together about 1200 million Euros, which account for the increase of one fourth when comparing to the previous year. (Tilastokeskus 2011.)

The most active visitors came from Russia. Their portion of all the passengers accounts for 40 %. The second active visitors came from Sweden and the third from Estonia. They are followed by Germany, Norway and the Great Britain. Slightly over half of the inbound visitors coming to Finland was leisure tourist. Acquaintance or relative visitors accounted for 13 % of all the visitors. 20% of the visitors were business travellers. (Tilastokeskus 2011.)

## 7 SUMMARY

The purpose of the study was to find out whether the volcano in Iceland had any impact on the inbound tourism. A majority of the secondary data of the tourism flow was provided by Icelandic Tourism Board and Statistics of Iceland.

When investigating the secondary data available of the impact to the inbound tourism, it is not clear enough to draw out a drastic conclusion. The total amount of foreign passengers decreased by 1,15%, while it had decreased the previous year (2009) by 1,72%.

The eruption started in March and at the same time there was an increase in tourism numbers. April and May demonstrated a tremendous decrease in the inbound tourism flow. June showed still a little decrease in comparison to the previous year, but from June onwards the numbers showed already a positive increase. August and September demonstrated again a little decrease, but for the rest of the year, the inbound tourism increased. The eruption had the biggest negative influence on inbound tourism from Central / Southern Europe (especially Spain and Italy). There were also individual countries whose tourism flow to Iceland decreased remarkably (Japan and Sweden). Also Norwegians and Danish cancelled their trips, which was mentioned already in the report made by Icelandic tourism board. Inbound tourism from North America grew intensively when comparing to the previous years.

The inbound tourism was also compared to the total amount of passengers going to Iceland (including also Icelanders). The total amount of passengers arriving to Iceland increased by 4,5% in 2010 while it had decreased 28 % in the previous year (2009).

The results were compared to the inbound tourism to Finland in the summer of 2010. The results showed a 5% increase in comparison to the previous year.

The factors which might have an influence on tourism flow need to be taken into account. The factors refer to the activity by the Icelandic authorities, i.e. campaigns organised by Icelandic government and operators, increased amount of tours and trips to the vicinity of the erupting area and increased media attention about the safety of Iceland.

The most affecting downward impact must have been the disruption in the aviation. The numbers of the passengers had been decreasing after the economic crash, i.e. after 2008. The effect of the economic crash have to take into account as well. The devaluation of the Icelandic Króna was considered as a positive pull factor for the inbound tourism as Iceland was seen as a less expensive country after the devaluation.

## SOURCES

Bowen, D. & Clarke, J. 2009. *Contemporary Tourist Behaviour. Yourself and Others as Tourists*. Cambridge: CABI Publishing.

Begg, D., Fischer, S. & Dornbusch, R. 2005. *Economics*. 8<sup>th</sup> Edition. United Kingdom: McGraw-Hill Companies, Inc.

Benediksdóttir, S., Gunnarsson, T. & Hreinsson, P. 2010 *Aðdragandi og orsakir falls íslensku bankanna 2008 og tengdir atburðir*, Icelandic Special Investigation Commission. Reykjavik: Oddi.

Benson, C. & Clay, E.J. 2004. *Understanding the Financial and Economic Impacts of Natural Disasters*. Disaster Risk Management Series. Washington: World Bank.

Bird, D., Gísladóttir, G. & Dominey-Howes, D. 2009. *Volcanic risk and tourism in southern Iceland: Implications for hazard, risk and emergency response education and training*.

Chisnall, P.M. 1997. *Consumer Behavior*. New York: Mcraw-Hill.

Cooper, C., Fletcher, J., Fyall, A., Gilbert, D. & Wanhill, S., 2005. *Tourism Principles and Practise*. England: Pearson Education Limited.

Duval, D. T. 2007 *Tourism and Transport, Modes, Networks and Flows*, Great Britain: Channel View Publications.

Latham, J. & Edwards, C.(eds)2003. *The Statistical Measurement of Tourism*. Cooper, C. 2003. *Aspects of Tourism, 8 : Classic Reviews in Tourism*. Channel View Publication.

Fennel, D.A. 2008. *Ecotourism*. London: Routledge.

Gee, C.Y., Makens J.C. & Choy, D.J.L. 1997. *The Travel Industry*. 3<sup>rd</sup> Edition. Canada: John Wiley & Sons Inc.

Gössling, S. & Hultman, J. 2006. *Ecotourism in Scandinavia: Lessons in Theory and Practice*: CABI Publishing.

- Hall, C.M., Muller, D.K. & Saarinen, J. 2008. Nordic Tourism Issues and Cases. Nature based tourism in Nordic Wilderness. Bristol: Channel View Publications.
- Holden, A. 2005. Tourism Studies and the Social Sciences. New York: Routledge.
- Kotler, P. 2000. Marketing Management. New Jersey: Pearson Education.
- Kotler, P., Bowen, J.T. & Makens, J.C. 2006. Marketing for Hospitality and Tourism. New Jersey: Pearson Education.
- Laws, E., Faulkner, H.W., Moscardo, G. 2005 Embracing and managing change in tourism: international case studies. London: Taylor & Francis e-Library.
- Lindroth, S. & Valtanen, S. 2010. Luonnonkatastrofien Vaikutuksen Suomalaisiin Matkailijoihin. Ammattikorkeakoulututkinnon opinnäytetyö. Hämeen ammattikorkeakoulu.
- Lockwood, J. P. & Hazlett, R. W. 2010. Volcanoes Global Perspectives. United Kingdom: Wiley-Blackwell.
- McIntosh, R.W. Goeldner, C.R. & Ritchie, J.R.B. 1995. Tourism Principles, Practices, Philosophies. USA: John Wiley & Sons, Inc.
- Newsome, D. Moore, S.A. Dowling, R.K. 2002. Aspects of Tourism 4: Natural Area Tourism: Ecology, Impacts and Management. England. Channel View Publications.
- Page, S. J. 2009. Transport and Tourism, Global Perspective. England: Pearson Education Limited.
- Ryan, C. 2003. Aspects of Tourism, 11: Recreational Tourism : Demand and Impacts. England: Channel View Publications.
- Swarbrooke, J., Beard, C., Leckie, S. & Pomfret, G. 2003. Adventure Tourism: The new frontier. Oxford: Butterworth-Heinemann.
- Toya, H. & Skidmore, 2005. Economic Development and the Impacts of Natural Disasters. University of Wisconsin. Available in: [http://sup.kathimerini.gr/xtra/media/files/fn/nat\\_skidmore.pdf](http://sup.kathimerini.gr/xtra/media/files/fn/nat_skidmore.pdf) (Read 16.3.2010)

Web links:

Almannavarnir. General information. Civil Protection in Iceland. Available in: [http://www.almannavarnir.is/displayer.asp?cat\\_id=133](http://www.almannavarnir.is/displayer.asp?cat_id=133) (Read 20.4.2011)

Air Transport Action Group (ATAG). Facts and Figures. Available in: <http://www.atag.org/content/showfacts.asp?folderid=430&level1=2&level2=430&> (Read 18.4.2011)

Euromonitor International. Travel and Tourism. Travel and Tourism in Iceland. Available in: [http://www.euromonitor.com/Travel\\_And\\_Tourism\\_in\\_Iceland](http://www.euromonitor.com/Travel_And_Tourism_in_Iceland) (Read: 18.1.2011)

Guardian UK. Japan earthquake and tsunami: what happened and why. Available in: <http://www.guardian.co.uk/world/2011/mar/11/japan-earthquake-tsunami-questions-answers> (Read: 6.4.2011)

Icelandic Met Office. Seismicity. Update on activity in Eyjafjallajökull. Available in: <http://en.vedur.is> (Read: 10.4.2011)

Inspired by Iceland. Available in: [www.inspiredbyiceland.com](http://www.inspiredbyiceland.com) (Read: 22.4.2011)

Keflavik Airport, 2011. About us. Available in: <http://www.kefairport.is> (Read: 15.3.2011)

Ministry of Industry, Energy and Tourism, Publications, The brochure Tourism in Iceland in figures. Available in: <http://eng.idnadarraduneyti.is/Publications/nr/2794> (Read: 18.1.2011)

Suomen suurlähetystö. Tietoa Islannista. Talous, elinkeinoelämä ja ulkomaankauppa. Available in: <http://www.finland.is/public/default.aspx?culture=fi-FI&contentlan=1> (Read: 20.10.2010)

UNWTO, World Tourism Organization. History. Available in: <http://unwto.org/en> (Read: 10.01.2011)

Visit Iceland, 2011. Visit Iceland. Travel Guide. Travel to Iceland by sea. Available in: <http://www.visiticeland.com> (Read: 15.3.2011)

Others:

Margherita Mori, Full Professor of Management of Financial Institutions, College of Economics, University of L'Aquila, Italy, Lecture of "Redevelopment After a Natural Disaster Principles of Disaster Management", 2010.

Almannavarnir. Icelandic Civil Protection Authorities. Information sessions during April 2010 in Reykjavik, Iceland.

Icelandic Tourism Board 2011, Erlendir Ferðamenn á Íslandi sumarið 2010 og samanburður við sumrin á undan

The Agricultural Association of South Iceland. The eruption in Eyjafjallajökull and the effect on agriculture in Iceland. Seminar 16.-17. September 2010.

Tilastokeskus. Liikenne ja Matkailu 2011. Rajahaastattelututkimus 2010 Kesä 2010 (1.5.-31.10.2010).



