



# **The Impact of Food Safety Measures Implementation on Indonesia's Exports of Fisheries**

A Research Paper presented by:

***Tika Nur Pusparani***

(Indonesia)

in partial fulfillment of the requirements for obtaining the degree of  
MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

**Economic of Development**

(ECD)

Members of the Examining Committee:

Dr. Luca Tasciotti (Supervisor)

Dr. Howard Nicholas (Second Reader)

The Hague, The Netherlands  
August 2015

***Disclaimer:***

This document represents part of the author's study programme while at the Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

***Inquiries:***

**Postal address:**

Institute of Social Studies  
P.O. Box 29776  
2502 LT The Hague  
The Netherlands

**Location:**

Kortenaerkade 12  
2518 AX The Hague  
The Netherlands

Telephone: +31 70 426 0460

Fax: +31 70 426 0799

# Contents

<i>List of Tables</i>	<i>iv</i>
<i>List of Figures</i>	<i>iv</i>
<i>List of Appendices</i>	<i>v</i>
<i>List of Acronyms</i>	<i>vvi</i>
<i>Abstract</i>	<i>vii</i>
<b>Chapter 1 Introduction</b>	<b>1</b>
1.1 Background	1
1.2 Problem Statement	3
1.3 Research Objectives and Research Questions	5
1.4 Research Metodology	5
1.5 Organization of the Research	7
<b>Chapter 2 Literature Review</b>	<b>8</b>
2.1 Theoretical Perspectives	8
2.2 Empirical Evidences	11
2.3 Indonesian Case Studies	13
<b>Chapter 3 Overview of Indonesian Fisheries and Food Safety Measures</b>	<b>17</b>
3.1 Indonesian Fisheries	17
3.2 Trends and patterns of Fisheries in the Main Destination Countries	19
3.3 Food Safety Measures	22
3.4 Food Safety Practices of Fisheries in Destination Countries	24
3.5 Indonesia's Food Safety Practices on Fisheries	27
<b>Chapter 4 Analysis and Discussion</b>	<b>30</b>
4.1 Food Safety Measures and Indonesia's Exports of Fisheries	31
4.1.1 Japan	32
4.1.2 United Sates of America (US)	33
4.1.3 European Union (EU)	35
4.1.4 Discussion	37
4.2 Restrictions caused by Food Safety Measures in the Importing Countries	38
4.2.1 Discussion	41
<b>Chapter 5 Conclusion and Policy Implication</b>	<b>43</b>
<i>References</i>	<i>45</i>

## List of Tables

Table 3.1	Portion of food safety regulations from total actual SPS notifications	23
Table 3.2	Japan's regulations in food safety that affect Indonesia's fisheries exports	24
Table 3.3	US' regulations in food safety that affect Indonesia's fisheries exports	24
Table 3.4	EU's regulations in food safety that affect Indonesia's fisheries exports	25
Table 3.5	Summary of importing countries requirements on fisheries	26
Table 3.6	Basic regulations related to food safety that affect fisheries	27
Table 3.7	Specific regulations related to food safety on fisheries	28
Table 4.1	Correlation coefficient of fisheries exports in relation to food safety measures and consumption per capita between 1996 and 2011	37

## List of Figures

Figure 1.1	Non-tariff measures on import	2
Figure 1.2	Product from developing countries which have been affected by SPS requirements of EU, based on survey conducted to all low and middle income countries in 1999	3
Figure 1.3	Share of fisheries export by destination between 2000 and 2013	4
Figure 1.4	Production and trade of Indonesia's fisheries in term quantity	4
Figure 3.1	Indonesia's fisheries production in term quantity	18
Figure 3.2	Indonesia's exports of fisheries in term quantity and value	19
Figure 3.3	Japan's fisheries production and consumption	20
Figure 3.4	US' fisheries production and consumption	21
Figure 3.5	EU's fisheries production and consumption	21
Figure 3.6	World's fisheries production	22
Figure 3.7	The number of total SPS notifications and SPS notifications related to food	23
Figure 4.1	Fisheries export performances of developing countries and Indonesia in term quantity	31
Figure 4.2	Japan's fisheries import quantity and consumption per capita	32

Figure 4.3	Indonesia's fisheries export quantity to Japan and Japan's consumption per capita	32
Figure 4.4	Indonesia's fisheries exports to Japan and Japan's food regulations after the establishment of SPS agreement	33
Figure 4.5	US' fisheries import quantity and consumption per capita	34
Figure 4.6	Indonesia's fisheries export quantity to the US and US' consumption per capita	34
Figure 4.7	Indonesia's fisheries exports to the US and US' food regulations after the establishment of SPS agreement	35
Figure 4.8	EU's fisheries import quantity and consumption per capita	35
Figure 4.9	Indonesia's fisheries export quantity and EU's consumption per capita	36
Figure 4.10	Indonesia's fisheries exports to EU and EU's food regulations after the establishment of SPS agreement	36
Figure 4.11	Share of fisheries exports from total food and agricultural exports of Indonesia	39
Figure 4.12	Portion of fisheries cases from total Indonesia's food safety cases in destination countries	39
Figure 4.13	Sources of food safety cases faced by Indonesia's fisheries in Japan	40
Figure 4.14	Sources of food safety cases faced by Indonesia's fisheries in the US	40
Figure 4.15	Sources of food safety cases faced by Indonesia's fisheries in EU	40

## List of Appendices

Appendix 1	Countries that became EU members since 1995	52
Appendix 2	List of Food and agricultural commodities	53
Appendix 3	List of developed and developing countries	54
Appendix 4	List of developed and developing countries	55

## List of Acronyms

ARIMA	Auto-Regressive Integrated Moving Average
CA	Competent Authority
DG SANCO	Directorate General for Health and Consumer Protection
EDA	Exploratory Data Analysis
EEZ	Economic Exclusive Zone
FAO	Food and Agriculture Organization
FDA	Food and Drugs Administration of the US
FVO	Food and Veterinary Office of EU
GATT	General Agreement on Tariff and Trade
HACCP	Hazard Analytical and Critical Control Point
MA	Moving Average
MA-OTRI	Market Access Overall Trade Restrictive Indices
MHLW	Ministry of Health, Labour and Welfare of Japan
MMAF	Indonesia Ministry of Marine Affairs and Fisheries
NTM	Non-Tariff Measure
NTB	Non-Tariff Barrier
OECD	Organization for Economic Co-operation and Development
OTRI	Overall Trade Restrictive Indices
RASFF	Rapid Alert System for Food and Feed of EU
SPS	Sanitary and Phytosanitary Standard
TBT	Technical Barrier to Trade
TRI	Trade Restrictive Indices
UNCLOS	the United Nations Convention on the Law of the Sea
UN Comtrade	the United Nations Commodity Trade Statistics Database
UNCTAD	the United Nations Conference on Trade and Development
SSOP	Sanitation Standard Operating Procedures
WTO	World Trade Organization

## **Abstract**

Food safety measure is part of the Sanitary and Phytosanitary Standards (SPS) which aim at protecting human health by ensuring food safety. Their implementation and compliance with the importing countries could influence the food trade performance of the exporting countries.

This paper analyzes to what extent food safety measures implementation by the main destination countries affects Indonesia's Fisheries exports. United States, Japan and European Union are the main importers of Indonesian fisheries and they have consistently applied the food safety measures. Therefore, the examination of the food safety measures impact to Indonesian fisheries exports is focused on these importers.

Inventory based approach employing a number of food safety regulation and border detention is analyzed using exploratory data analysis (EDA). The result suggests that even though not very significant, the food safety measures still negatively influenced fisheries exports to Japan while the falling demand of fisheries in this country was also responsible for the decline of Indonesia's fisheries exports. Meanwhile, the negative effect was not seen in fisheries exports to the US and EU.

Furthermore, the great portion of food safety cases faced by fisheries in the recent years, shows that food safety measures in the importing market still have caused problems and risks to Indonesia's fisheries exports. Therefore, food safety standard harmonization between Indonesia and importers as well as the consistency in the application of food safety practices is necessary to comply with the food safety measures of the importing countries.

## **Relevance to Development Studies**

Trade is one of the engines of economic growth because of its significant contribution to national GDP as well as its role in creating jobs for the community. Given that fisheries is one of potential exports commodity of Indonesia which involves many employments, optimal utilization of this sector will support the enhancement of Indonesia's non-oil exports performance that would contribute to development of the Indonesian economy. Therefore, by recognizing the barriers that inhibit Indonesia's fisheries exports, the strategic actions can be taken to improve the efficiency of this field in the future.

## **Keywords**

Food safety measure, Fisheries exports, Sanitary and Phytosanitary, Non-tariff Barrier

# Chapter 1

## Introduction

### 1.1. Background

Indonesia participation in the international trade arena is perceived as a very important and inevitable tool to foster growth. Therefore, the Ministry of Trade of the Republic of Indonesia has set trade as the engine for the country's economic growth in its strategic plan (Ministry of Trade 2010). The development of International trade toward free trade is characterized by trade liberalization through the removal of trade barriers to facilitate trade. As a consequence of tariff barrier reduction, Non-Tariff Measure (NTM) has become an important economic discussion because of its potential influence to international trade. Although the International institutions such as World Trade Organization (WTO) and the United Nations Conference on Trade and Development (UNCTAD) suggested that NTMs can give certain benefit through regulating the international trade, the strict NTM imposed by destination countries becomes the challenges to Indonesia's exports because of its inhibiting effect (UNCTAD 2013)

In 2015, the Indonesian Ministry of Trade is targeting an increase in the percentage of exports by 300%.<sup>1</sup> This increase is equivalent to USD 459 billion up to 2019, where in the previous years, non-oil exports performance of Indonesia's non-oil exports reached USD 145 billion.<sup>2</sup> Upon the exports target declaration, the fisheries sector should also increase the amount of its exports since fish and fish products are the potential exports commodity of Indonesia.<sup>3</sup> Therefore, Ministry of Marine Affairs and Fisheries (MMAF) expressed its support to increase fisheries export value by setting exports targets with the amount of USD 5.4 billion, 17% higher than realized exports in 2014.<sup>4</sup> It is very reasonable, considering the potential of Indonesian fisheries that has not been optimally exploited.

The importance of fisheries sector to the economy showed by the data of Statistic Indonesia in 2013 which presented the fact that fisheries sector was the earning source of 2.6 million of Indonesian households.<sup>5</sup> It also showed by the increase in the fisheries production which gave positive growth of national economy for about 5.2% and gave a 19.2% contribution to GDP for agricul-

---

<sup>1</sup> <<http://industri.bisnis.com/read/20150127/12/395830/ekspor-perikanan-mendag-pancang-300-menteri-susi-siap-di-angka-100>> (accessed April 2015)

<sup>2</sup> <[http://dipen.kemendag.go.id/app\\_frontend/accepted\\_rsses/view/552775ad-6084-401e-8ddb-085dc0a83502](http://dipen.kemendag.go.id/app_frontend/accepted_rsses/view/552775ad-6084-401e-8ddb-085dc0a83502)> and <<http://www.kemendag.go.id>> (Accessed April 2015).

<sup>3</sup> Indonesia Ministry of Trade. <<http://www.kemendag.go.id/en/economic-profile/10-main-and-potential-commodities>> (accessed March 2015)

<sup>4</sup> <<http://kkp.go.id/index.php/berita/tanpa-transshipment-target-ekspor-hasil-laut-bisa-meningkat/>> (Accessed April 2015)

<sup>5</sup> Statistic Indonesia <<http://www.bps.go.id>> (accessed March 2015)

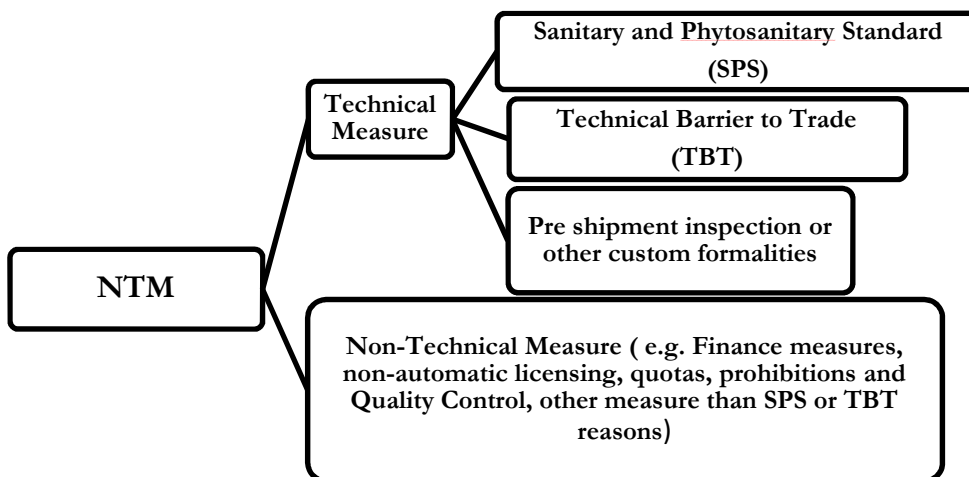


tural groups in 2011.<sup>6</sup> Thus, the fisheries sector has a strategic role for the Indonesia's GDP.

Because fish and fish products are the product that more perishable than other animal origin products, the implementation of food safety measures on this product is necessary to ensure the safety of the products for human consumption (Allshouse et al. 2003). Food safety measures as a part of SPS measures have significance to protect human health through the application of certain standards or guidelines on food products including fisheries.<sup>7</sup> Hence, the countries with more concern to food safety apply SPS measures with the objective to ensure the safety of food products.

NTM in general is consists of various policies other than tariffs may be applied at the time of exports and import with commercial or non-commercial purposes, with the intention of regulating international trade flows. According to UNCTAD (2013), NTM often interpreted as a Non-Tariff Barrier (NTB) because of its inhibitory effects to trade. NTM that applied on imports can be visualized by the figure 1.1 below. It consists of non-technical and technical measures where SPS be a part of it.

**Figure 1.1.** Non-tariff measures on Import.



*Source: UNCTAD (2013)*

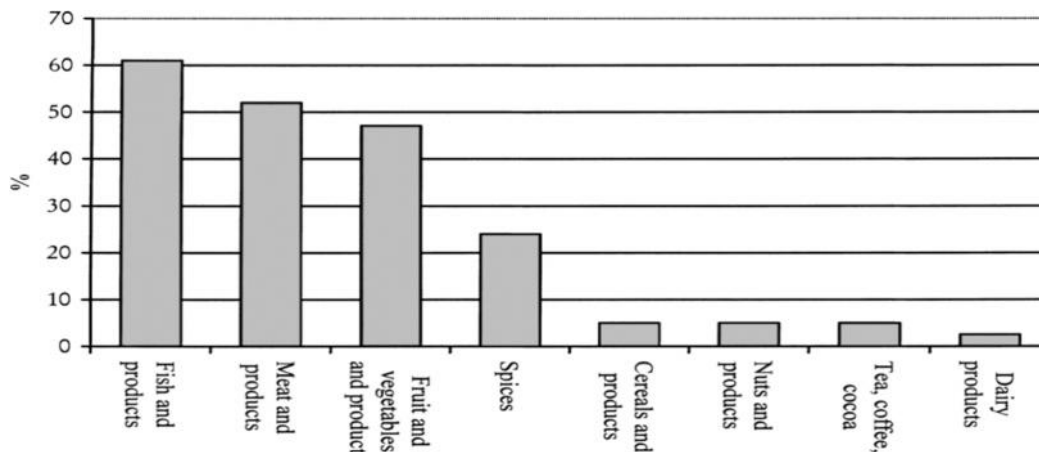
The application of SPS measures on trade can gives the restriction effects, especially from developing countries (Jongwanich 2009). Furthermore, Henson and Loader (2000) found that The European Union, Australia, USA and Japan are the countries with the highest stringency level SPS requirements to developing countries' exports. Their surveys conducted to all low and middle in-

<sup>6</sup> Indonesia Investment Coordinating Board: <<http://www.bkpm.go.id/img/file/fisheries.pdf>> (accessed March 2015)

<sup>7</sup> World Trade Organization. Current Issue in SPS. <[https://www.wto.org/english/tratop\\_e/sps\\_e/sps\\_issues\\_e.htm](https://www.wto.org/english/tratop_e/sps_e/sps_issues_e.htm)> and Codex Alimentarius as the food safety standard, guidelines and codes of practice. About Codex. <<http://www.codexalimentarius.org/aboutcodex/en/>> (Accessed March 2015)

come countries in 1999, resulted that fisheries products are the commodities which have been highly prevented by SPS measures in the European Union as illustrated by Figure 1.2.

**Figure 1.2.** Products from developing countries which have been affected by SPS requirements of EU, based on survey conducted to all low and middle income countries in 1999.



*Source: Henson and Loader (2000)*

As consideration, SPS agreement arose in 1995 as there were certain some trade disputes about SPS between developed countries that could not be solved by the previous General Agreement on Tariffs and Trade (GATT). Therefore, the disputes accommodated by the science-based technical measures as outlined in the SPS agreement (Pauwelyn 1999 and Henson and Loader 2000). In order to enforce transparency, any imposition of measures such as technical regulations and conformity assessment standards which have an impact on trade barriers need to be notified to the WTO, including the measures in SPS field.<sup>8</sup> Specific to increase the food safety awareness, the importing countries' government will increase the adoption of policy and regulations related to the safety and quality of food, including the measures which applied at the border. Thus, the border detention caused of food safety measures also demonstrated how the measures harm the trade flow (Ababouch et al 2005).

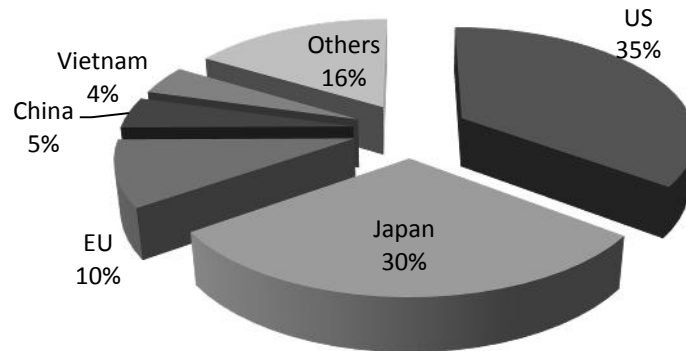
## 1.2. Problem Statement

Figure 1.3 presents the top importers of Indonesian fisheries. The figure reflected that the United States of America (USA), Japan and the European Union (EU) are the main exports destination countries of Indonesian fisheries. US, Japan and EU have average export value about 600, 523, and 170 million USD per year between 2000 and 2013. The export value to these three destinations covers 75% of total Indonesian fisheries export value. Furthermore, these

<sup>8</sup> World Trade Organization.  
<[https://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/agrm4\\_e.htm](https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm4_e.htm)> ( accessed 2015)

countries, according to Henson and Loader (2000) are also the countries with the most inhibiting SPS requirements on agricultural exports of developing countries.

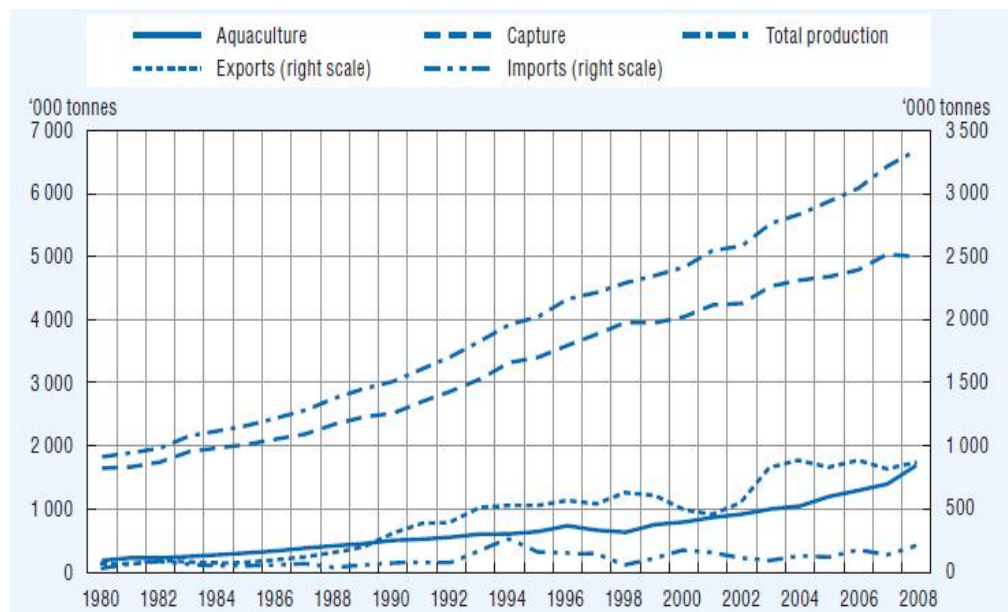
**Figure 1.3.** Share export of fisheries by destinations between 2000 and 2013.



*Source: Author own illustration based on the Data and Information Centre Ministry of Trade Republic of Indonesia.*

Meanwhile, Figure 1.4 shows the Indonesia's fisheries production and trade between 1980 and 2008 recorded by the Organization for Economic Co-operation and Development (OECD) in 2012. On average, the fisheries production rate raised 4.7% per year between 1980 and 2008, but it is noted that fisheries exports performance was stagnant between 2003 and 2008. In this period, the quantity of export was stabilized at about 14% from total production while the production rate was increasing at 3.6% per year. This condition not only caused by the increasing of domestic consumption, but also can be caused by the implementation of food safety measures by the main importing countries (OECD 2012).

**Figure 1.4.** Production and trade of Indonesia's fisheries in term quantity.



*Source: OECD (2012)*

Because SPS agreement permits the member countries endorse their measures to protect human health only if these measures have passed appropriate scientific justification based on health risk assessments. Therefore, developed countries are quite possible to raise the stringency of their SPS measures in food safety requirements to accommodate their increasing demand of safer food (Jongwanich 2009). Realizing stricter food safety measures has been applied by the USA, Japan and EU. The fisheries exports performance of Indonesia to these destination countries could be affected by these measures.

### **1.3. Research Objectives and Research Question**

The objective of the research is analysing to what extent food safety measures implementation by the main destination countries affects Indonesia's fisheries exports. In this case, correlation between notified food safety measures and export quantity will be observed with considering other main important factor. In addition, the research will focus on the restrictions caused by the measures.

To achieve these objectives, the research will have this question:

- To what extent do Indonesia's fisheries exports face the restriction problems caused by the implementation of the food safety measures by main destination countries?
- What are the main economic consequences of the measures implementation on Indonesia's fisheries export?

### **1.4. Research Methodology**

UNCTAD (2013) suggested the utilization of inventory based approach as one of the methods to examine NTB both qualitatively and quantitatively. This approach employs the number of regulations, notifications of trade barriers or number of detention as the details of NTB. In NTB measurement, the researchers usually used the outcome of inventory approach as a proxy in other estimations in order to expand the research coverage (Beghin and Bureau 2001).

To achieve the objectives, the Exploratory Data Analysis (EDA) then used to evaluate the impact of food safety measures on Indonesia's fisheries exports. EDA can be used before the use of confirmatory data analysis to understand some economic behaviour through the use of appropriate and informative tables, graphs, and basic statistics (Unwin 2010). The use of EDA is very useful in the research to obtain a better understanding and to gain important information about the observed variables as stated by Hartwig and Dearing (1979). They also suggested that this method will simplify the data and make it become easier to understand.

'EDA is flexible and data driven', it allows the data analysis to be conducted in many different ways. The information can be obtained without the presence of formal limitation, even though the user still need to consider the most proper way in gaining the information (Unwin 2010). This research uses the EDA because of these reasons. EDA will be able to provide the information to achieve the research objectives by integrating it with inventory approach which is be-

lieved could inform the detail of food safety measures adequately. Given that the information of food safety cannot be generalized because of differences in its implementation, the use of EDA is more required at this time to intensify the study of the data. Research that focused on the main destination countries will make it easier to identify the results. It facilitates the observation of food safety measures in each main destination countries to maximize the research purpose and further policy making.

Because EDA can be collaborated with many other methods (Unwin 2010), therefore, EDA is sufficient to analyze the information from inventory approach as the research conducted by Anders and Westra (2012). Then, the observation of the research focuses on Japan, US and EU separately. Since these importers have the biggest share of Indonesia's fisheries exports which have consistently applied food safety measures, the sufficient inventory data are available to observe. It then could be used to produce useful information on food safety measures in the main importing countries to become an input for EDA.

According to Fugazza (2013) quantity-impact analysis is considered to give accurate explanation of the effects of NTMs on trade and also enabling more systematic estimation. This is because the exports detention caused by food safety measures will directly impact on exports volumes. The trade lost caused by the manifestation of the measures and the exports cancelation when the cost to comply is too high can be explained by the detail of NTM (Ababouch 1995, Beghin and Bureau 2001 and Ardakani et al. 2009). Consequently, the research then conducted to analyze the effect of food safety measure on trade quantity.

To observe the impact of SPS implementation of food safety requirements for Indonesia's fishery exports, the quantitative secondary data will be collected from both international and national data sources:

1. FAO database
2. Indonesian Ministry of Trade
3. World Trade Organization
4. Food inspection database of the importer countries: Rapid Alert System for Food and Feed Products (RASFF) of European Union; Food and Drugs Administration (FDA) of the United States; and Ministry of Health, Labour and Welfare of Japan
5. UN Comtrade

The research is conducted to analyze the impact of SPS measures in food safety imposed by main destination countries to Indonesia's fisheries exports using inventory based approach integrated with EDA. These destination countries which become the object of observation are Japan, the United States of America (USA) and the European Union (EU). Given that there is a change in the EU's membership, EU countries that participate in this research are the countries that have been become EU members since 1995.

A compiled import fisheries data ranging from 1980 to 2011 are analyzed to provide the comprehensive information on the research before and after the implementation of SPS agreement in 1995. The research considers the con-

sumption level of fisheries in the destination countries as the factor that also significantly influences fisheries exports. Because food safety measures introduced after the enactment of SPS agreement, later, the data about fisheries exports and SPS notifications related to food safety between 1996 and 2011 are estimated to allow the identification of the effects of food safety measures implementation to exports.

To give additional information, the problems caused by the measures during its application are analyzed to provide better understanding about the effect of food safety implementation to fisheries export. The data of export detention in the border will be observed. The time span of this part of analysis will be different in each country due to the availability of the data. Therefore, the discussion of the research is done by considering these limitations.

In addition, due to time constraints and data limitation, this research will give a contribution to the Indonesian fisheries sector and further research by giving the information based on data analysis that has been done. The effect of food safety measures implementation of fisheries exports will be obtained by analyzing the export performance of Indonesian fisheries when the main destination countries apply food safety measures by using available important information.

## **1.5. Organization of the Research**

This research is organized into five sections. Introduction section consists of background, problem statement, research objectives and research questions and research methodology and also the organization of the research. Second part of the research presents the theoretical framework, empirical evidences Indonesian case studies which included in the literature review section. Then, the third section gives the overview of Indonesian fisheries, trend and pattern of food safety measures in importing countries, food safety measures as well as food safety practices in importing countries and Indonesia. After that, analysis and discussion is conducted in section four, then followed by conclusion and policy implication in the last section

## Chapter 2

### Literature Review

#### 2.1. Theoretical Perspectives

According to UNCTAD (2013), the SPS measures are applied to organize and facilitate international trade. It ensures the safety of the products by preventing the entry of diseases of animals and plants from abroad. However, the high level of tightness, complexity and differences in national standards and inspection system of this measure applied by importing countries really give difficulties for exporting countries (Ababouch 2005). Therefore, the existence of the current SPS measure may affect trade because of its role as a non-tariff barrier that could hinder exports.

There are two different concepts of NTM in the economy. NTM concept in affecting trade can be trade-oriented or welfare-oriented. It has differences in defining it theoretically and also in assessing the effects. Observing the impacts based on trade-oriented concept will only focus on its impact on trade, while welfare-oriented approach try to figure out broader effect on the economic welfare beyond trade. Nevertheless, basic measurement of NTMs is to simplify the complex effect to become a form of indicators that can represent the effects of NTMs on trade or economic welfare depends on the magnitude of the observed scope. Assessing the impact of NTMs using trade-oriented concept such as price-comparison and quantity impact measurements are more commonly used, since the effects of NTMs on trade performance are more desirable in international economic discussion (Beghin and Bureau 2001).

The character of NTM as a barrier to trade is escalating the costs to fulfil the requirements and to cope with border restrictions. Hence, the implementation of standard and requirements can influence supply side by hampering the exports of foreign suppliers through its costs effect. Meanwhile in the demand side, there is “demand enhancing effect” of NTM by providing the clear information to the consumers. If the demand enhancing effect is bigger than the cost effect, the implementation of non-tariff measures will affect the producer’s competitiveness in the view of consumer, that could lead to an increase in demand and raises exports in both price and quantity (Fugazza 2013).

In accordance with UNCTAD (2013), the NTMs including food safety measures generally are more complex and costly than tariff measures. Dealing with this issue, the developing countries that generally are in the group of middle and low income do not have the sufficient infrastructure to facilitate it. Moreover, tariff measures are still widely used in developing countries on trade policy although in the reality NTMs are more restrictive than measures in the tariff form. Different from tariffs and quotas, the costs incurred in an effort to meet food safety standard are not directly covered by a number of prices paid by consumers, because it is difficult to convert the food safety charges in the form of cost value which directly can be charged at the price

If as the exporter, a developing country cannot meet the food safety requirements, they will lose its market share in this destination country. The required cost to meet importer standard with more stringent food safety level would give problem to developing country exporters. Aside from the cost used to upgrade its production technique, costs to obtain information and certification from importing countries' agent would be very expensive. Hence developing country's exporter would be deterred from doing exports if the cost still higher than the benefit that will be gained. (Mitchell 2003).

Negative effects of NTM were usually suffered by developing countries especially on their food and agricultural exports (Henson and Loader 2000). Jongwanich (2009) supporting this by stating that food safety measures as a part of technical NTM also provided an obstacle to exporters especially from developing countries. Furthermore, Fontagne et al. (2005) also found that SPS in environmental field negatively affected certain agricultural products while majority manufactured products gained the positive effects. The result of Bao and Qiu (2010) research in China suggested that the implementation of NTB was promoting manufactured goods when it restricted agriculture goods. Other fact comes from Bagumire et al. (2010) which explain that as one of agriculture commodities, aquaculture products exports which mostly come from developing countries is certainly affected by the food safety regulation applied in the US and EU. Several estimations of NTMs effects to trade of some agricultural commodities in developing countries also reported the negative effects.

Different from primary product, the NTMs including SPS and TBT usually do not give restrictions to manufactured products. Since SPS concerns more to the hygiene and sanitation of the products (Filho 2014), this type of products is not negatively affected by SPS. The condition and quality of manufactured products are more controllable as well. Manufactured products utilize higher technology that can be used to produce goods which are in accordance with foreign standards, so, the cost to comply with market requirements relatively low. When compliance cost is relatively lower than information cost on importing market, the positive effect of NTM can be found (Moenius 2004, as cited in Bao and Qiu 2010). Furthermore, this could explain why most previous studies found a negative relationship between NTM and agricultural trade, while it was not found in manufactured goods. However, some results suggested about insignificant effects of NTM on primary goods such as the results presented by Fontagne et al. (2005) and Filho et al. (2014). Not significant impact of certain NTMs on Brazilian fisheries and fruit products from the OECD countries showed that NTMs is not always hinder trade of agricultural products.

Although the problems seem very difficult for developing countries to maintain its trade relations with developed countries, some efforts must be done to compete in International market. When exporters are able to overcome required NTM in importing countries, NTM may no longer be a barrier to their exports. As one solution, exporting countries are required to implement equivalent food safety standards with the importing country standards to make the products are acknowledged and have an adequate safety level (Jongwanich 2009). When there is a big gap between exporter and importer standards, harmonization can be conducted for the exports purposes. Exporting countries



can adopt the standard of importing country or both countries adopt the standard that internationally accepted. Bilateral negotiation in the form of standard harmonization can become a solution to propagate demand from consumers that promotes exports in the future (Mitchell 2003 and Ababouch 2005).

There are some problems in measuring NTM's effect to trade, because "unlike tariffs, NTMs are not straightforwardly quantifiable, not necessarily easy to model, and information about them is hard to collect" (Fugazza 2013:1). In addition, according to Beghin and Bureau (2001), measuring the effect of NTB requires a simplification process of a complex effect into one measurable indicator that sufficiently represents and reflects the effect of NTB. Specific related to SPS, quantitative assessment of the effect of SPS to trade in general is difficult to be done because of data limitations and the nature of SPS which is less transparent than other trade barriers such as tariffs and quotas. This measure is also not sufficiently clear where information on trade policies and regulations with regard to the SPS are different in each country (Ababouch, et al 2005). Inadequate information and the lack of consistency become the problems in build an empirical model. However measurement may still be able to do even though the information of the impact of NTB still captures the impact of other factors that become limitation of the research (Beghin and Bureau 2001).

The impact of NTMs to trade still can be conducted by quantifying its impact on price and quantity. The details about NTM are used to explain the trade lost caused by the manifestation of the measures and the exports cancelation when the cost to comply is too high (Beghin and Bureau 2001 and Ardakani et al. 2009). Based on Beghin and Bureau (2001) and Fugazza (2013), the variable set of NTM also utilized to capture the demand enhancing effect of standard implementation, since almost explanatory variables in the quantitative approach cannot separate the demand-enhancing effect that comes along or after the cost effect occurs. So, the opposite impact of NTMs can also be captured through the detection of trade escalation when the increase of price and quantity due to standard fulfilment exceeds the production costs.

Fugazza (2013) also stated that quantity-impact analysis is considered to give accurate explanation of the effects of NTMs on trade and also enabling more systematic estimation. Because basically, the application of NTMs can affect the amount of exports, for instance is when the exports were detained because of the border inspections as mentioned by Ababouch et al. (2005). On the other hand, value based estimation can be used as well, because it is identical with quantity-impact measurement that has already included the price element. Both quantity and value impact measurement mainly use the quantitative approach with the information of NTMs perform as explanatory variables and trade volume or value as exploratory variables (Fugazza 2013 and Ardakani 2009).

## 2.2. Empirical Evidences

The results of most previous quantitative studies with the objective to observe the effects of NTMs include SPS and TBT on the exports of developing countries have highlighted the negative relation (Ardakani et al. 2009, Alaeibakhsh and Ardakani 2012 and Melo et al. 2013). In other words, this non-tariff measures application by developed countries has decreased food exports from developing countries. Guillotreau and Péridy (2000) used quantitative approach to assess the trade barriers on European imports of seafood. They conducted econometric estimation to panel data set of bilateral trade between EU and 48 exporting countries. Tariff coupled with NTBs in tariff equivalent stand for trade barrier measures in the gravity model. Even though only very small effect, the result of their research showed the negative relationship between NTBs and the quantity of seafood imports.

The recent econometric study was done by Ardakani et al (2009) who also used an ad valorem tariff equivalent of NTBs to study the effects of NTBs on Iran main agricultural exports. This proxy was gained from dividing domestic Freight on Board (FOB) prices with world FOB prices to convert NTBs to a tariff form. The study resulted that NTBs have greater negative effects than tariffs. In accord with Beghin and Bureau (2001), the use of tariff equivalent in the estimation made NTBs become quantifiable although it precision in capturing the effect of NTBs only accurate if the perfect substitution of traded goods holds. Besides that, the tariff equivalent seems not entirely indicate the price differences caused by NTBs.

The similar effect of TBT was also found by Bao and Qiu (2010) in agricultural products in China, but on oppositely, application of TBT turns positive impact on the trade of manufacture products. They used inventory approach to gain import coverage ratio and frequency index of TBT as the input in the gravity equation. The coverage ratio informs how wide the TBT affects trade, though there is endogeneity between the coverage ratio and the trade value. Other information of TBT attendance was presented by the frequency index even with the disadvantage that this number does not definitely capture the affected goods. Nonetheless, these two proxies still can give enough information of the existence of TBT to become the inputs of the econometric model (Bao and Qiu 2010 and Filho et al. 2014).

Afterward, Alaeibakhs and Ardakani (2012), Melo et al (2013) and Li et al (2013) who used the gravity model to reflect the implementation of SPS measures or other NTBs to trade of various food commodities also found the restrictive effects of NTB. In the research of Alaeibakhs and Ardakani (2012) and Li et al (2013), the use of econometric models through dummy variables was conducted to determine the economic effects when NTB has applied. This variable usually described the implementation status of NTB in a country without adequately gives statistical variability (Beghin and Bureau 2001). Alaeibakhs and Ardakani (2012) tried to quantify SPS and TBT impact on Iran pistachios exports. They simply taking into account dummy variable of SPS+TBT equal to 1, if the importing countries have notified at least one barrier. On the other hand, Li et al (2013) enclose dummy variable to know the

effect of US food safety regulation to its exports performance. Besides to differentiate US exports condition before and after the implementation of a food safety regulation, they also put dummy variable to distinguish the importing countries based on their food safety level.

Other finding from Fontagne et al. (2005) found the positive impact of environmental SPS measures on trade to several non-agricultural products. Only concentrated milk as a food product gets positive impact of this measure. Their assessment to find the impact of environmental trade barriers to trade was conducted by analyzing environmental-related notifications that affect 161 product groups including food and non-food using econometric approach. In this case they realize that their analysis of agricultural and food products need more in-depth analysis that requires specific data about environmental management. Furthermore, not significant effect of non-tariff barrier to Brazilian fisheries exports showed by Filho et al. (2014). They used different analytical elements to anticipate the limitations of the data. They used integrated inventory-based and “auto-regressive integrated moving average” (ARIMA) model with dummy variable to know the impact of several forms of NTB. Then, the correlation between exchange rates and exports was analyzed to find out how close the relationship between exports and the purchasing power of importing countries. The result of the research presented that only fresh fish as the most perishable product experienced restriction on its exports, while other fishery commodities was not affected by the measures. The inaccuracies of the analysis was recognized by the researchers, but this study scientifically has provided more simple NTB analysis, by using statistic calculations and visual displays besides the utilization of ARIMA model.

On the contrary, Henson and Loader (2000) conducted a comprehensive study of the SPS by using qualitative approaches and statistic tools to explore the impact of SPS implementation to trade. This research analyzed the degree of SPS measures impediment to food and agricultural exports of developing countries. According to them, SPS was the most crucial barrier to trade that must be conquered through international institution's role in facilitating the developing countries to get over with this measure. They also recommended advanced countries to be wise when imposing a standard by considering the differences of SPS level between them and developing countries. Encouraging developing countries to actively improve their ability to cope with this measure had become their concern as well. This study gave broad information about the role of SPS as a barrier to trade especially for developing countries albeit without providing its impact quantitatively.

Meanwhile, there have been only several studies that specifically focused on the effect of food safety implementation to trade. A fact showed that food safety standard application by developed countries has decreased food exports from developing countries. Between 2002 and 2004 Indonesia was one of the countries that had experienced many cases of detention in the US food market as mentioned by Jongwanich (2009). His research observed food exports of 79 countries in the period between 1999 and 2006 to the US. To find the impact of food safety standard as the manifestation of SPS measures to food exports from developing countries, he used the incidence of detention in the US market as the proxy of SPS measures implementation. The result claimed that food

safety standard implementation hampers food exports of developing countries. This method seems very reflects the effect of SPS to trade, however, it is not easy to obtain the data related to the number of export detention with quantity involved. Only a few developed countries that record their border rejection cases but it still not easy to access as disclosed by Ababouch et al. (2005).

With sufficient data observation, a quantitative study related to food safety was conducted by Li et al. (2013) with the aim to discover the impact of Hazard Analysis Critical Control Point (HACCP) as US food safety management system to its seafood exports. This study tried to see the differences of US exports performance to 38 countries before and after the application of HACCP by US government, and also the impact of HACCP implementation in the destination countries to US exports. They used of gravity model with regulation implementation status as the dummy variables. They also enclose dummy variables of country groups which were arranged based on the HACCP implementation status. Then, significant positive impact of HACCP implementation to US exports was reported. HACCP also proved its positive effect of raising US exports to the countries with the same level HACCP implementation. It shows that food safety management system applied in the US increases the quality of US seafood and then encourages its exports.

Previous study with econometric approach was done to estimate the NTM's effect to trade performance in general as conducted by Fontagne et al. in 2005. Research also carried to find the impact of NTM that specifically applied by one or several countries to a group of exporting countries, as the research of Jongwanich (2009) and Li et al. (2013). Meanwhile, some researchers studied the impact of global trade barrier on a country exports as done by Gebrehiwet et al. (2007), Ardakani et al. (2009) Bao and Qiu (2010) Alaebakhs and Ardakani (2012), Melo et al (2013). These researches have sufficient observation data to employ an empirical model to capture the effect of NTM. Differently, Filho et al. (2014) analyzed NTB effect imposed by EU on Brazilian exports of fisheries by using autoregressive approach. To gain the NTB's effect, this study used the information of exports data series in its modeling, and integrated it with NTB implementation as dummy variable. Supporting this, simple statistic approach then conducted to capture the extent of NTB's effect. The statistic tools as used by Henson and Loader (2000) also very useful to measure the NTB's effect to trade. This kind of study also conducted by Ababouch et al (2005) as well to clearly observe the detail of NTB implemented by each main fisheries importing countries though without considering its effects to trade flows.

### **2.3. Indonesian Case Studies**

In 2001, Walidah et al. presented their result of their study about Indonesian frozen shrimp exports detention by FDA in 1998. They found that Indonesian shrimp experienced rejection in US market because of *Salmonella* contamination. SPS measures related to food safety that implemented by US in the border have inhibited Indonesian shrimp exports. They used survey based approach to conduct the "causing-problem analysis" in the study. The dominant factors that caused exports detention of Indonesian shrimp in US market can be known by conducting surveys and interviews, and then combine them with

information obtained from the literature study. Other qualitative research by Sunorita and Tjarsono (2014) notified that EU has implemented very strict requirements to its imported foods. Their library study result expressed the number and the stringency of EU regulation giving problems to Indonesian shrimp exports. Both studies are very useful for the fisheries sector in Indonesia, especially in policy making to improve the quality of shrimp commodity in order to meet importers requirements in food safety. This study also gives broad information to support the next research in the same field, especially to provide an understanding about the recent condition faced by Indonesian fisheries.

Fakhrudin (2008) analyzed the effect of whole trade barrier imposed by trading partner using Trade Restrictive Indices (TRI) calculation. The calculation was conducted comprehensively where included Overall Trade Restrictive Indices (OTRI) and Market Access Overall Trade Restrictive Indices (MA-OTRI). The aims of each calculation were to know the effect of trade barrier to exports and to know the level of trade restrictiveness faced by Indonesia in international market. Through this method, researcher gains the information about the trade restriction level of the importing countries to Indonesian exports commodity. This method is quite tricky since it has several steps in the estimation. Based on Kee et al (2006), firstly, the researcher needs to quantify NTBs impact on trade quantity. Secondly, the estimation of ad valorem equivalent of NTBs is carried out by converting the quantity impact of NTB into price equivalent. Lastly, researcher should incorporate the ad valorem equivalent with the tariff restriction to get the restrictiveness indicator. The interesting results of this research is when it notifies that the NTBs contribution to trade barrier is greater than tariff barriers, where protection faced by agriculture commodities is twice bigger than it in manufacture commodities. This study comes up with broad analysis of trade barrier faced by the main exports commodities of Indonesia. In NTBs calculation context, actually, Fakhrudin (2008) utilized trade coverage ratio and frequency index in the estimation that considered have certain consequences to its validity.

Rastikarany (2008) and Painte (2008) performed quantitative study about the effect of tariff measures and non-tariff measures to seafood exports.<sup>9</sup> The impact of NTMs or NTBs implementation to Indonesian tuna exports was done by Rastikarany using econometric method namely Moving Average (MA) modelling. She used dummy variable to characterize EU's NTMs implementation. The result of her study showed that tariff, exports volume in previous two years and NTMs applied by EU affect the current volume of tuna exports although the influence of NTMs was not statistically significant.

Almost similar to Rastikarany's study, Painte (2008) observed the effects of Tariff barrier and NTBs to shrimp exports to the EU. Analysis of NTB's effect was obtained by regressing non-tariff dummy variables, tariff variable and vari-

---

<sup>9</sup> These research paper are undergraduate thesis from Bogor Institute of Agriculture. Author included this in the literature study to enrich the knowledge of the methods being used

able of exports lag against Indonesian shrimp exports volume during the period 1992-2006. She found that the NTBs give positive effect to Indonesian shrimp exports volume while tariff showed the opposite effect. Moving average method that was used by both researchers utilize information in one time series data in the model formation, series of exports data was analyzed with considering NTB implementation as the dummy variable.

In different field, Dahar et al. (2014) investigate the enforcement of NTMs to Indonesian horticultural exports to the ASEAN +3 countries. Descriptive analysis was utilized to analyze the problems faced by horticultural exports. In order to discuss the NTMs especially SPS and TBT, they used inventory based approach by using inventory of NTMs to compute coverage ratio and frequency index of these NTMs. UNCTAD (2013) explained that “frequency index” is used for assessing the existence of NTMs and calculating the share of product which was affected when NTMs are imposed. Meanwhile, the “Coverage ratio” showed the trade share that must comply with the NTMs applied by the destination countries to give a picture about NTM coverage to the whole trade. Thus, by computing the frequency index and the coverage ratio, researchers can compare the application of NTM (SPS and TBT) that influence horticulture sector in each country (Dahar et al. 2014).

The most of quantitative studies deal with the problems related to transformation of the NTBs information into a numeric form, for example, the price comparison method which usually used as the input of the empirical model (Deardorff and Stern as cited by Beghin and Bureau, 2001). Following Beghin and Bureau (2001), this also experienced by other proxy variables which constructed using inventory-based or survey-based approach. Then, the empirical models such as gravity model were applied to obtain the quantity-impact or value impact of NTMs using the quantification of NTMs above. The validity will be obtained if there is a sufficient and large dataset in the estimation with consideration that the proxy of explanatory variable has adequately captured the information of NTMs. But when there are limitations in data availability that only a small number of countries have the NTMs information, and also if there are some calculation problems, certain different strategies can be considered.

Because of data limitation, previous Indonesian studies with quantitative approach generally employ dummy variables. Even according to Beghin and Bureau (2001), those variables have statistical weakness as the explanatory variable. Furthermore, data aggregation sometimes affects the estimated trade effect as well. Still, the diversity of the result obtained is usually dependent on the type of NTBs, the data variability, the proxy, the model specification, and other complexity of the methodology. Although the econometric estimation techniques have much improvement in discussing the recent problems, sometimes it also still has limitations. For example, when the analysis cannot be generalized and limited to countries, sectors, types of measures, and also can be caused by the nature of its own econometric estimation (Fugazza 2013).

Based on literature study, it was known that the assessment of the NTMs as a barrier to trade can be conducted by various methods quantitatively or qualitatively. Because Indonesian studies that focusing on the food safety measures as

in fisheries are very limited, so it is necessary to take an approach that directly suggests the influence of recent food safety measures to Indonesian fisheries exports performance. There are no particular methods agreed by the experts to determine the impact of NTBs to trade due to its lack of homogeneity and data availability (Beghin and bureau 2001 and Filho 2014). Because every method of analysis has its own advantages and disadvantages, thus, an approach which is considered as the most appropriate method to reach the specific objectives can always be done.

Inventory based approach is suitable to be used in this research because the number of measures could give sufficient statistical variability where they aren't found in discrete variables. Because this research focuses on USA, Japan and EU, the exertion of this approach is quite plausible. These importing countries implement food safety measures consistently, so the sufficient data are available to observe. Indonesia's previous research conducted by Fakhruddin (2008) and Dahar et al (2014) used weighted inventory proxies namely Coverage ratio and frequency index although they realize that there is a weakness in it. Endogeneity occurs in the coverage ratio when more restricted NTMs related to the decreasing of trade level as its weight, so the coverage ratio become underestimated. On the other hand, frequency index not really accurately reflects the products exposed by NTMs (UNCTAD 2013). More simple approach which employs unweighted measures such as the number of regulation in the targeted field might be used as an indicator of NTM. The rejection cases in the border and complaints in the importer's market could also give pertinent information (Beghin and Bureau 2001). When the goods exposed by border cases can be detained, rejected, destroyed or be returned to the exporters, then the quantity of traded goods could be affected by NTM applied at the border. Based on the perspective above, the term of the border cases can be used to analyze food sanitary and hygiene aspect of traded goods as done by Walidah et al. (2001).

Although the use of EDA in studying the impact of NTMs is still limited, the assessment of food safety measures impact to fisheries exports with EDA methodology is believed can provide adequate information required by Indonesian fisheries sector and further research as well. The influence of NTM to bilateral trade will be captured by using this method, the relation of food safety measures implementation and exports is observed by looking at the data directly and focusing to the main destination countries.

## Chapter 3

# Overview of Indonesian Fisheries and Food Safety Measures

### 3.1 Indonesian Fisheries

Indonesia is the largest archipelago in the world, with about 17,000 islands, 1.9 million km<sup>2</sup> of land area and 3.1 million km<sup>2</sup> of water area. Indonesia has Exclusive Economic Zone (EEZ) of approximately 3.0 million km<sup>2</sup> and length of coastline more than 81,000 km. The geographical conditions and Indonesia location between the Indian Ocean and the Pacific Ocean make Indonesia rich in diversity of marine life. The great water territory of Indonesia places fisheries sector has a potential role to the Indonesian economy (Susilowati 2012).

In the period of 2009-2012, the average growth trend of the fisheries sub-sector GDP achievements based on current prices was 13.13%, with the value of 177 trillion in 2009 and reached 255 trillion in 2012. On the other hand, the trend of National GDP in the same period was increasing about 13.95% from 5.6 trillion IDR in 2009 to 8.242 trillion IDR in 2012. Growth of fisheries' GDP based on constant prices in this period was 6.49%, slightly higher than the national GDP growth which was about 6.31%. On the basis of constant prices of 2000, GDP of fisheries sub-sector continuously experienced significant growth over the years 2013, with an average increase of 6.45% (MMAF 2013).

Although the contribution of the fisheries sector in the Indonesia's GDP is not very big, the important role of fisheries sector in the Indonesian economy is also because of the fact that this sector became the income sources of 2.6 million households in 2013 and as national food security contributor. In 2013 Statistic Indonesia noted that 1.6 million households were involved in the aquaculture industries, and almost 1 million households made fish capture as their source of earnings (FAO<sup>10</sup> and Statistic Indonesia).

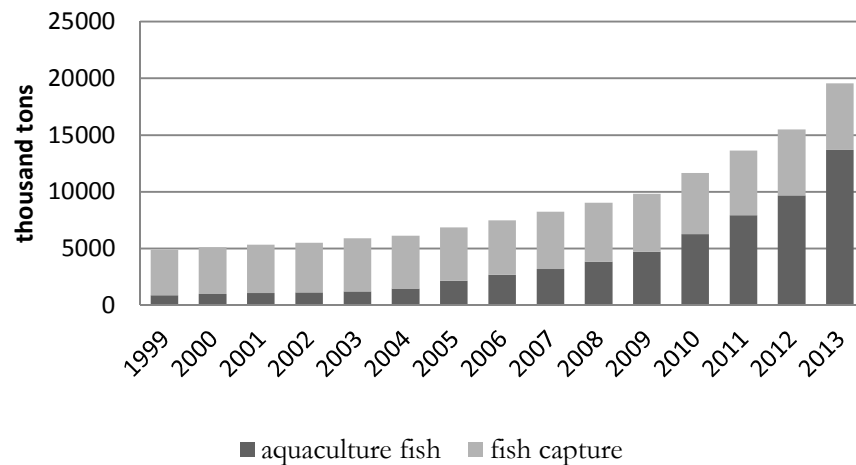
Figure 3.1 shows that during the period 2010-2013, aquaculture production had increased significantly of approximately 28.64% per year. The production volume was only 6.28 million tons in 2010, more than 9.5 million tons in 2012 and now it has reached more than 13.7 million tons in 2013. Meanwhile the aquaculture production value also increased about 22.51% per year in the same period. Even though not as big as aquaculture, capture Fisheries production was likely to increase as well. Capture fisheries production in 2006 amounted to 4.81 million tons and increased to 5.71 million tons in 2011 then it increased again to 5.86 tons in 2013.

---

<sup>10</sup> FAO (n.d.) National Aquaculture Sector Overview: Indonesia.  
<[http://www.fao.org/fishery/countrysector/naso\\_indonesia/en](http://www.fao.org/fishery/countrysector/naso_indonesia/en)> (accessed in June 2015)



**Figure 3.1.** Indonesia's fisheries production



*Source: Own calculation base on Indonesian Marine and Fisheries statistics.<sup>11</sup>*

In 2013, the production value increased by 37.07% with the value of 213 trillion IDR compared to production value the year before which was about 155 trillion IDR. Trend of Indonesia's fisheries production value between 2009 and 2013 tended to increase by 23.22% growth, with 47.60% contribution from capture fisheries and 52.40 % contribution from aquaculture fisheries (MMAF 2014).

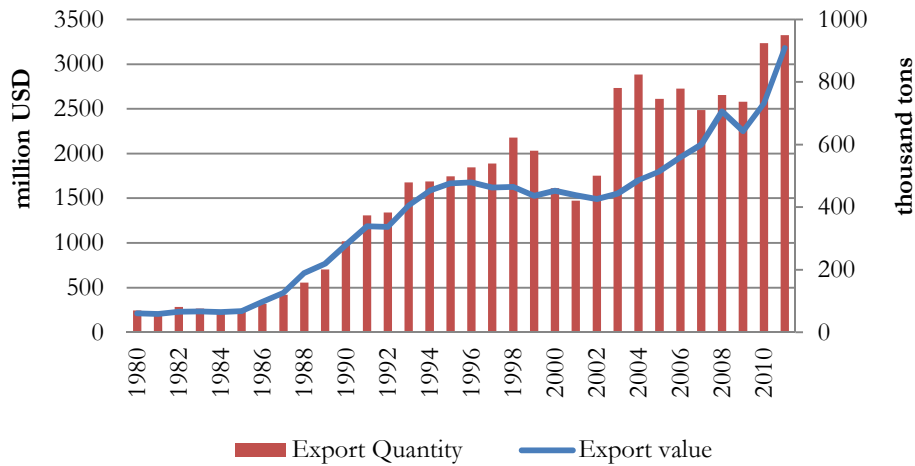
World demand for fish and fish products will continue to evolve over time. Hence, the good and responsible management of the potentials in fisheries sector will contribute to the national economy through the availability of employments and the enhancement of exports revenue. Therefore, the mission to strengthen competitiveness through productivity improvements should be made to encourage the development of marine and fisheries as one of the priorities of development.<sup>12</sup>

Similar pattern of exports volume and export value is shown in the Figure 2.2. It shows that Indonesia's total fisheries exports rose both in value and volume in the first 1980s and fell down in the end of decade until it then started to increase again in 2002. The value slightly decreased in the period between 1996 and 2002 but tended to increase after 2003 until it fell again in 2009 due to global economic crisis. The exports volume also showed almost the same behaviour when it dropped in 1998 and recovered again after 2001. But, the weakening of exports in term volume happened again between 2004 and 2009 before significant enhancement of export value and export volume then appeared in 2010 which was expected to still occur until recent years.

<sup>11</sup> Indonesian Marine and Fisheries statistics, Ministry of Marine Affairs and Fisheries Republic of Indonesia. <<http://www.statistic.kkp.go.id>> (accessed in March 2015).

<sup>12</sup> National Medium Term Development Plan 2015-2019. The Ministry of National Development Planning Republic of Indonesia. <[http://www.bappenas.go.id/files/2514/0374/8955/PEMBANGUNAN\\_KELAUTAN\\_DAN\\_PERIKANAN\\_DALAM\\_PRIORITAS\\_PEMBANGUNAN\\_NASIONAL\\_2015-2019\\_Jakarta\\_28\\_Januari\\_2014.pdf](http://www.bappenas.go.id/files/2514/0374/8955/PEMBANGUNAN_KELAUTAN_DAN_PERIKANAN_DALAM_PRIORITAS_PEMBANGUNAN_NASIONAL_2015-2019_Jakarta_28_Januari_2014.pdf)> (accessed in June 2015)

**Figure 3.2.** Indonesia's exports of fisheries in term quantity and value.



*Source: Own calculation based on FAO database*

Although in the last few years the fishery exports were increasing, in the early 2000s, the trend of exports had stagnated and even fell in its value and volume as well. Given that fish production in Indonesia has positive growth, the slow-down in exports should not happen. Considering the fisheries potential, it seems still possible to boost the fisheries growth sector in Indonesia, one of the ways is by overcoming the existing barriers.

### 3.2 Trends and Patterns of Fisheries in the Main Destination Countries

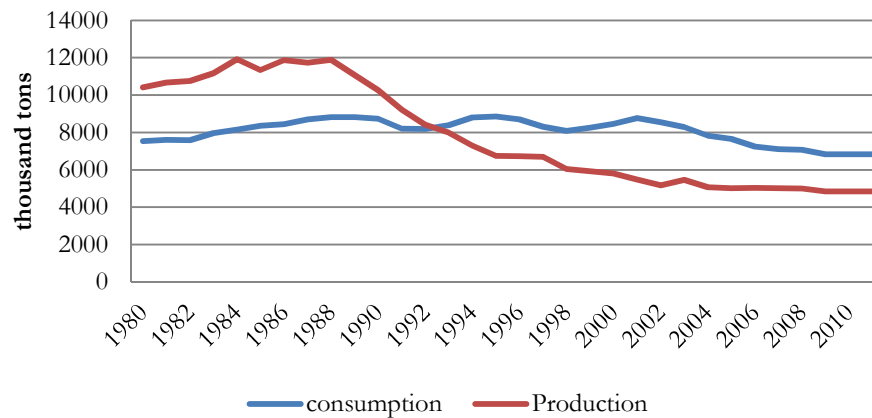
Recently, fisheries production in Japan, US and EU in general has not experienced improvement. In the past two decades US' fisheries production has been in stagnant condition while the decreasing trend faced by Japan and EU. According to Bagumire et al (2010) the decline in fisheries production in several developing countries was due to certain factors related to capture fisheries are-as that have reached the maximum exploitation limit. Thus, at this time the increase of fisheries production really depends on aquaculture sector. Based on a survey conducted by Ministry of Agriculture, Forestry and Fisheries of Japan in 2011, Popescu and Ogushi (2013) stated that declining in fish resources can be caused by several factors such as overexploitation or environmental and climate problems.

In Japan, the shrinkage of its fishing area was also due to gradual enforcement of United Nations Convention on the Law of the Sea (UNCLOS) regulation about Economic Exclusive Zone (EEZ) of countries' waters territory. This agreement determined that EEZ of a country is the zone with a radius of 200 miles from the base line of the beach. In this zone, a coastal state has rights

over the natural resources inside it and has the right to enforce its policy in this zone.<sup>13</sup>

Because of the obligation to comply with the decision, Japan should stop its operation in several fishing location which is known as other state EEZ (Popescu and Ogushi 2013). Despite its fish consumption is also declining in the last several years, Japan domestic production as shown in Figure 3.3 still cannot meet its demand of fisheries. So, fish importation become unavoidable by Japan. The fall of fisheries production force Japan to meet its demand of fisheries by importing them from abroad.

**Figure 3.3.** Japan's fisheries production and consumption

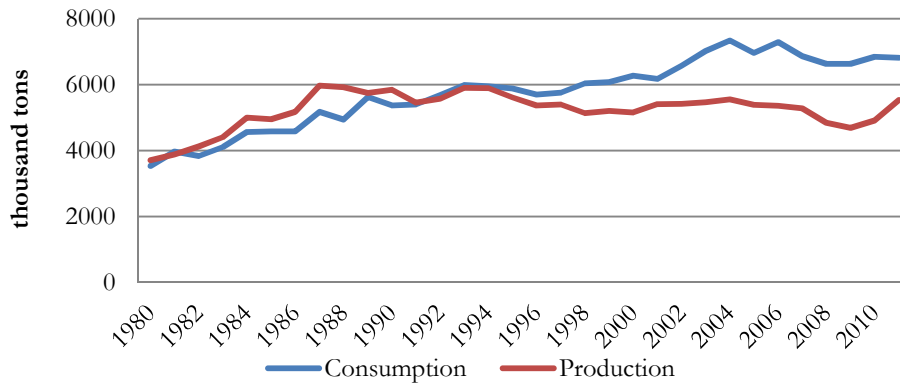


*Source: own illustration based on FAO database.*

Figure 3.4 shows that fisheries consumption in the US was raising. But oppositely, the US fisheries production tended to decrease after 1994 due to the lessening of fishing area and the fish stock inside as well. After 1990, the decreasing of fish stock especially in several areas such as northwest Pacific which located around US territory, where the fisheries almost reached its maximum sustainable production. It drives US to do some actions to control fish exploitation in those areas with the intent to restore their sustainable productivity (FAO 2014).

<sup>13</sup> Hollis (2010), <<http://www.coeearth.org/view/article/156775/>> (accessed July 2015)

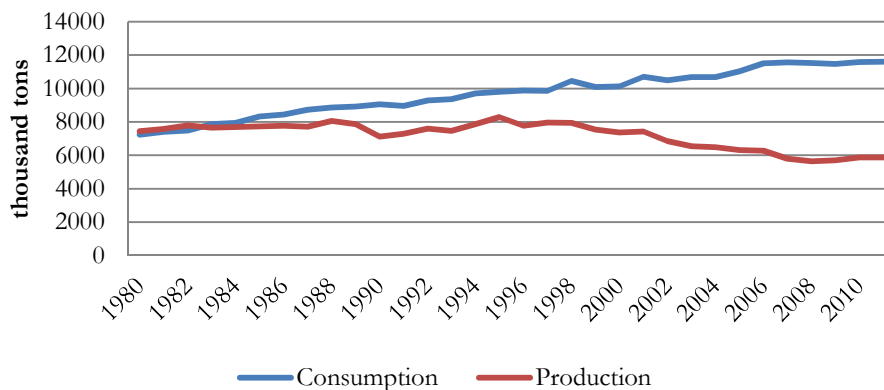
**Figure 3.4.** US' fisheries production and consumption



*Source: own illustration based on FAO database.*

As presented in Figure 3.5, EU's consumption growth of fisheries cannot be addressed by its production. In accord with Palin et al (2014), fish stock in European waters gradually decreased from 47% in 2003 and noted only 35% in 2012. Because of this reason, EU was committed to limit its fishing activities in the over-exploitation areas to restore its condition by 2015. This environmental reason also encouraged US, Japan and several EU member countries issued a policy to limit their fishing fleets (FAO 2014).

**Figure 3.5** EU's fisheries production and consumption.

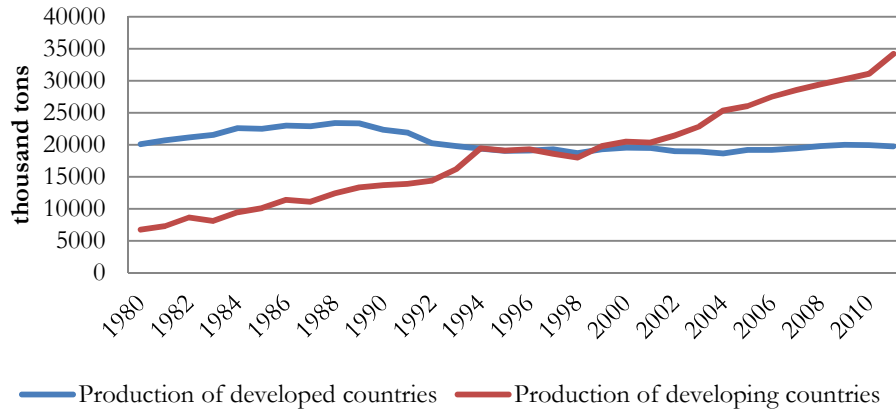


*Source: own illustration based on FAO database.*

Some developed regions have high fish consumption but faced falling in fisheries production capacity. Thus, these countries become very dependent on import from abroad especially from developing countries (FAO 2014). This problem is faced by the biggest fish consumers like Japan, US and the EU, therefore, they need to import fish and fishery products from developing countries. On average the developing countries production growth reached 4.89 % between period 1980 and 2011 while production of developed countries was decrease by 0.51 %. Considering the FAO report in 2014, the fisheries consumption of developing countries is lower than the fish consumption of developed countries because of their income gap. So, larger part of fishery products of developing countries is allocated for exports. Fishery exports growth of developing countries was about 5.38 % between 1980 and 2011 and 2.78 % growth was faced by developed countries at the same period. Although fisheries production of developing countries growing rapidly since the early

1990s, its exports growth just slightly greater than the exports of developed countries as seen in figure 3.6.

**Figure 3.6** World's fisheries production



*Source: own illustration based on FAO FishStat database.*

The raising of fisheries demand in main importing countries encourages developing countries to improve this sector for exports purposes. Furthermore, the increasing of fisheries production especially from aquaculture sector with Asian region as the biggest contributor increases the fisheries exports of developing countries (FAO 2014). The great flow of fisheries exports from developing countries to developed countries causes developing countries much affected by food safety measures in fishery products which have been implemented by developed countries as stated by Filho (2013).

### 3.3. Food Safety Measures

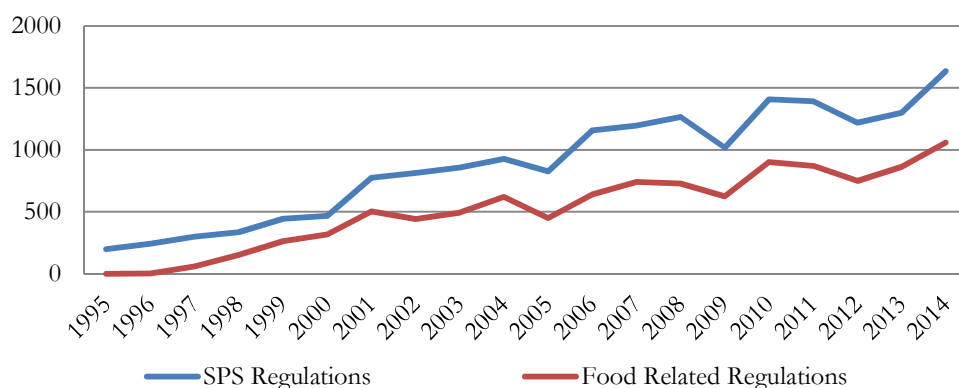
To participate in International trade, a country needs to comply with international regulations. To set the technical measures implementation beyond the quantitative barrier, WTO facilitates it by setting TBT and SPS agreements. Developing countries which generally export the agriculture products should be able to meet the needs of the consumer from developed countries that are generally scarce in agricultural commodity. Thus, developing countries will compete in the world market only if they meet the consumer requirements (Henson and Loader 2000).

Thus, increasing awareness of a country in its objective to protect public health from the dangers brought by foods from abroad can simply be represented by its SPS notifications relating to the food safety measures. Because according to Jongwanich (2009) the SPS notifications can provide the information about proposed standards enforcement, requirements or implementation methods of SPS measures, the use of notification in estimating the impact of SPS on trade had been undertaken by Fontagne et al. (2005). They utilized the number of SPS notification which related to environment as the indicator of the Environmental Resources Management (ERM) applied by importing countries.

Elimination of all forms of quantitative barriers on agricultural products was the impact of the implementation of the GATT. It makes countries switch their focus to the application of technical measures with a variety of concerns. Figure 3.7 shows the increasing concern of WTO member countries in SPS

measures and SPS measures relating to food regulations after the enactment of the SPS agreement. An increasing number of SPS notifications coincide with the increasing number of notifications in food regulations which contain food quality control requirements and food standard. The food related notification has 59% share from the total SPS notifications between 1995 and 2014. It then explains the raising of global concern of food safety and the possibility that this behaviour will influence fisheries trade.

**Figure 3.7.** The number of total SPS notifications and SPS notifications related to food<sup>14</sup>



Source: Own illustration based on WTO database.

In Japan, US and EU, the measures related to food dominate the SPS measures which have been notified to the WTO as informed by table 3.1. Japan actual SPS notification about food regulation was about 72% from the total SPS notification between period 1995 and 2014. The US and EU have their big share of food regulations as well, when 78 % from total notification was addressed to food regulations in the US and 73 % in the EU. It means that food safety is the important issue in international food trade.

**Table 3.1.** Portion of food safety regulation from total actual SPS Notification between 1995 and 2013

No	Country	Portion of food safety regulation from total SPS notifications
1	Japan	72 %
2	USA	78 %
3	EU	73 %

Source: WTO database.

<sup>14</sup> The number of food safety regulations in the figure consist of notified “food quality control” measures and “food standards” which are part of SPS notifications.

### 3.4. Food Safety Practices of Fisheries in Destination Countries

High level of development of Japan, Us and EU leads to more protection of these countries to their domestic consumers. Many policies and regulations were issued to guarantee the safety of their food including fishery products. The regulations are applied to all food in the market both from domestic producers and imported food products from abroad. The table 3.2 to 3.4 bellow listed the food regulations in destinations countries that affect fish and fisheries products.

**Table 3.2.** Japan's Regulations in food safety that affects Indonesia's fisheries exports

Year Established	Legislation	Focus	Covering
2003	Food Safety Basic Law	Food safety regulation	Risk assessment  Its deal with food sanitation law (1947, as amended) Risk management

*Source: FAO National Aquaculture Legislation Overview: Japan (n.d)*

**Table 3.3.** US Regulations in Food Safety that affect Indonesia's fisheries exports

Year Established	Legislation	Focus	Covering
1995	Seafood Rule (FDA, 1995)	Sanitary procedures for processing and importing fish and fishery product into the USA	Good Hygienic Practices Hazard Analytical and Critical Control Point (HACCP) food safety system
The end of 2003	FDA Interim Final Regulation (21 CFR Parts 1 and 20)	Pre-shipment requirements	Mandatory registration for domestic and foreign food processor, producer or holder before the products enter and circulate in the US

*Source: Ababouch et al. (2005).*

**Table 3.4.** EU's Regulations in food safety that affect Indonesia's fisheries exports

Year Established	Legislation	Focus	Covering
2002	EC Regulation 178/2002	General principles of food law	Food safety procedures Structure and role of European Food Safety Authority (EFSA) Basic concepts of equivalence and traceability
2004	EC/853/2004	Food hygiene requirements	HACCP food safety management systems and procedures
2004	"EU Food Hygiene packages" which contain of four regulations in food hygiene.	Food hygiene requirements for foodstuff in general and food of animal origin and also its official controls	New food hygiene regulations; about general and technical requirements, HACCP system, specific regulations in animal origin food products, official control and veterinary certification

*Source: Ababouch et al. (2005)*

HACCP (Hazard Analytical and Critical Control Point) system is food safety management system 'as a process that identifies risks associated with production and consumption of goods and monitors critical points in the process to assure safe foods' (Li et al 2013: 15). This system has been fully implemented in the US and its application in the seafood sector is mandatory. Many countries adopted this food safety system although the procedure for its implementation is not exactly in the same way. European Union countries and Japan apply food safety system by integrating HACCP system with the existing food regulation (Li et al 2013). Nevertheless, according to Ababouch et al (2005), implementation of Japan's food safety system to foreign suppliers is not clear enough.

All the regulations above become the basis of the implementation of food safety measures with the aim to ensure the safety of imported fisheries. In its practice, the food safety measures are implemented in the border. It can be in the inspection form with procedure, standard and testing methods which is different in each destination country. This border control system often gives problem to the exporters. The exporters will need more cost to comply with all the requirements and criteria of destination countries. Still, the lack of standard harmonization between the importers also reduces the efficiency and increases the difficulty for the suppliers (Ababouch et al 2005). Generally, food safety practices in fisheries imports of the destination countries presented in Table 3.5 below:



**Table 3.5.** Summary of importing countries' requirements on fisheries

<b>Requirements of the importing countries or region in fisheries</b>		
<b>European Union (EU)</b>	<b>United States (US)</b>	<b>Japan</b>
Exporters employ basic GHP/ HACCP system and be examined by their Competent Authority (CA) that has been certified by EU	Exporters employ basic Sanitation Standard Operating Procedures (SSOP)/ HACCP system	Exporters employ basic Good Hygiene Practices (GHP)/ HACCP system but its implementation towards imported products is not clear
Exporters are compulsory to pass a series of the inspection system to confirm that the EU's legal and technical requirements are fulfilled	Exporters must pass US' inspection system, but not as obligatory as it conducted by EU	Exporters must pass the Japanese inspection system, but with a much lower level than those carried out by EU
Importers receive cleared imports	Importers inform authority of all imports. Importers ensure that the Exporters apply SSOP/ HACCP system and confirmed it to FDA inspectors.	Importers inform authority of all imports. Importers company cooperate with the Exporting company in quality control purposes.
Identity examination at the border is conducted for all imports	Identity examination at the border is conducted for all imports	Identity examination at the border is conducted for all imports
Imported goods must pass the physical inspection with various frequency depends on the importers' status and history	Imported goods must pass the physical inspections with the various frequency depends on the importers' status and history	Imported goods must pass the physical inspection with the various frequency depends on the importers' status and history
Frequency of microbiological and chemical inspections are determined based on the level of quality, product type, examination characteristics, country of origin and Exporters' history	Frequency of microbiological and chemical inspections depends on the priority on those year	Frequency of microbiological and chemical inspections depends on the priority on those year
Requirements or guidance of physical, microbiological and chemical examination in accordance with EC legislation	Requirements or guidance of physical, microbiological and chemical examination in accordance with US FDA regulation	Requirements or guidance of physical, microbiological and chemical examination in accordance with Japan's Food Sanitation Law and Quarantine Law
Required microbiological tests include: Examination of <i>L. monocytogenes</i> , <i>E. coli</i> , <i>Salmonella</i> , <i>S. aureus</i> , <i>Vibrio</i> spp.	Required microbiological tests include: Examination of <i>Enterotoxigenic E. coli</i> (ETEC), <i>L. mono-</i>	Required microbiological tests include: Examination of <i>Coliform</i> , <i>E. coli</i> , <i>total live bacteria</i>

	<i>cytogenes, Salmonella, S. aureus, Vibrio spp., C. Botulinum</i>	
Required chemical tests include: Histamine, heavy metals, veterinary drugs, and pesticides	Required chemical tests include: Histamine, heavy metals, Veterinary drugs and pesticides	Antioxidants, preservatives, veterinary drugs, colouring and bleaching, agents and biotoxins

Source: Ababouch et al 2005

Basically, to comply with the food safety measures of the importing countries, exporters must give evidence that their products already meet the food safety standard of destination countries. In the practice, the exported fishery products must pass the identity and documentary examination in the border. The products should be handled in the appropriate condition to ensure the safety of the products and keep its appropriateness to be consumed by domestic consumers. Aside from documentary check, periodic inspection is done with reference to the existence guidelines to check the conformity of food products (Listiani 2013 and Palin et al 2013).

### 3.5. Indonesia's Food Safety Practices on Fisheries

Indonesia's concern on food safety has been running for long enough. This is reflected in the ratification of various regulations in the field of food safety. Basic framework on food safety was adopted in 1996 as Act no.7 on food (1996). The regulations specifically regarding fish product safety were issued in 2002. To enhance the regulation on food safety before the government then imposed a regulation of the Republic of Indonesia number 28/2004 on food safety, quality and nutrition. Regulation in the field of food safety that affects fisheries products are set out in the table 3.6.

**Table 3.6.** Basic regulations related to food safety that affect fisheries

Year Established	Regulation	Focus	Covering
2002	Decree of Minister Of Marine Affairs and Fisheries No Kep.01/MEN/2002	Integrated quality management system of fisheries products	Provisions relating to the development of quality of fishery products based on the concept of HACCP

2004	Law No 31 of 2004 on Fisheries	quality management of fishery products which have a stronger legal basis than the prior legislation	<ul style="list-style-type: none"> <li>- HACCP concept on fisheries.</li> <li>- Quality control of fishery products</li> <li>- health standards Implementation on fisheries activities</li> <li>- Maintenance of fisheries infrastructure.</li> <li>- Certification system</li> </ul>
------	--------------------------------	---	---

*Sources: FAO National Aquaculture Legislation Overview: Indonesia (n.d.) and Efendi and Yusra (2012).*

As written in Table 3.6, HACCP is the food safety concept which adopted by Indonesian government. This concept recognized as the most accepted concept to ensure food safety and can be applied to all the food supply chain includes in the fisheries field. Those standards have been adapted to the food system standard issued by the National Standardization Agency (BSN) of Indonesia and fit with CODEX as international standard (Listiani 2013).

The enactment of EU regulation CD 2006/236 requires the inspection program for food safety factors by the Food and Veterinary Office (FVO), Directorate General for Health and Consumer Protection (DG SANCO) of European Commission against trading partners from third countries including Indonesia. MMAF appointed as the Competent Authority (CA) in fishery products by European Commission. As the CA, MMAF should ensure that the application of quality assurance and food safety system are harmonized with the EU quality standards. For these aims, several regulations assigned to support the MMAF role in ensuring food safety of fishery products are already complying with EU requirements (Efendi and Yusra 2012). In order to encourage the quality assurance and safety of fishery products, the MMAF put out some more specific regulations, such as presented in table 3.7.

**Table 3.7** Specific regulations related to food safety on fisheries

Year Established	Regulation	Focus	Covering
2007	Regulation of the Minister of Marine Affairs and Fisheries (PER.01/MEN/2007)	Controls on the systems of quality assurance and safety of fishery products	Arrangements on the implementation of quality assurance and safety of fishery products at production, processing and distribution stages.

2007	Regulation of the Minister of Marine Affairs and Fisheries (PER.02/MEN/200)	Monitoring of veterinary drugs residue, chemical, biological materials, and contaminants on fish farming	
2007	Regulation of the Directorate General of Processing and Marketing of Fishery (PER.03A/DJ-P2HP/2007)	Control on the system of Quality Assurance and Safety of fishery products	

*Source: Efendi and Yusra (2012).*

The application of these regulations is expected to increase the effectiveness of the system of quality assurance and safety of fishery products in Indonesia. Thus, Indonesia can anticipate the demands of international trade and overcome trade barriers in the fisheries sector.

## Chapter 4

### Analysis and Discussion

According to calculation by Indonesian Ministry of Trade, Japan, the United States of America (US) and European Union (EU) are the top importers of fishery products from Indonesia. The research analysis about the impact of food safety measure to Indonesia's fisheries exports is based on the observation on these three import destinations separately. The fact founded by Henson and Loader (2000) that these countries and regions are the importers with the most inhibiting SPS requirements to agricultural exports of developing countries, is the main reason of the research focus as well.

First analysis is conducted to capture the impact of food safety measures to fisheries exports. Firstly, to support further discussion about food safety measures effect to trade, the research need to incorporate other important variable. Annually fisheries import data and consumption per capita of destination countries during the period ranging from 1980 to 2011 is observed. This analysis is conducted to gain the import and consumption pattern of importing countries before and after the establishment of SPS agreement in 1995. This part then observes Indonesia's exports to the main destination countries between 1996 and 2011 by considering the food safety behaviour of the destination countries after the establishment of SPS agreement.

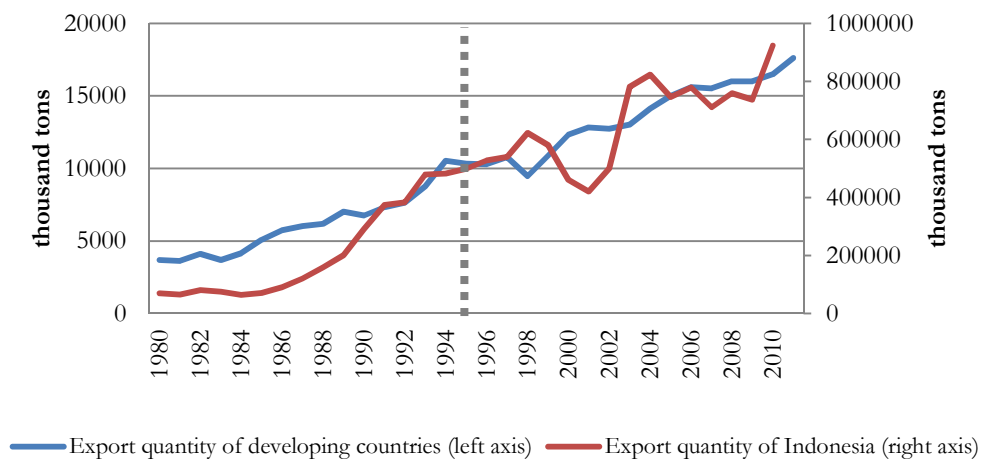
The second part focuses on the restriction problems faced by Indonesian fisheries in the importers market to gain more information about the effect of the measures to export. The information is obtained from other point of view to support prior finding. The detentions of fisheries export provide the restriction problem faced by fisheries in the importing market. For this aim, analysis is conducted toward the number of violation that faced by Indonesia's fisheries between 2007 and 2013 for Japan, and period between 2004 and 2013 for US and EU.

The analysis uses data from international sources such as FAO, WTO, UN Comtrade database and also the data from Ministry of trade as the National data source. Global fisheries data was collected from FAO statistic database. Bilateral trade data of fisheries was collected from several sources namely Indonesian Ministry of Trade and UN Comtrade while SPS measure notification was obtained from WTO database. Notification In this research is the actual notification which has taken into account "in force" and "initiated" notification in the particular years after the enactment of SPS agreement. Certain government databases related to food safety became the reference of the violation cases in food safety. Import refusal report of US-FDA, notification of food sanitation violation from MHLW of Japan and food alert notification of EU-RASFF are reviewed for this purpose.

## 4.1. Food Safety Measures and Indonesia's Exports of Fisheries

Figure 4.1 shows the exports trend of developing countries and Indonesia before and after implementation of SPS agreement. The fisheries exports of developing countries in 1994 were almost tripled from its volume in 1980. Indonesia's fisheries export value experienced greater enhancement in this period. The import value in 1994 increased six times from its value in 1980. In 2010, fisheries exports of developing countries increased about 60% from its export quantity in the year after the establishment of SPS agreement, while percentage change value of Indonesia's fisheries exports reached 85%. The increasing of exports were almost the same between Indonesia and developing countries after the application of the SPS agreement although Indonesia's fisheries exports experienced weakening in several periods compared with developing countries exports. If fisheries product of developing countries faced the highest SPS restriction as stated by Henson and Loader (2000), Indonesia's fisheries may be experienced the same problem.

**Figure 4.1.** Fisheries export performances of developing countries and Indonesia in term quantity



*Source: Own illustration based on FAO database.*

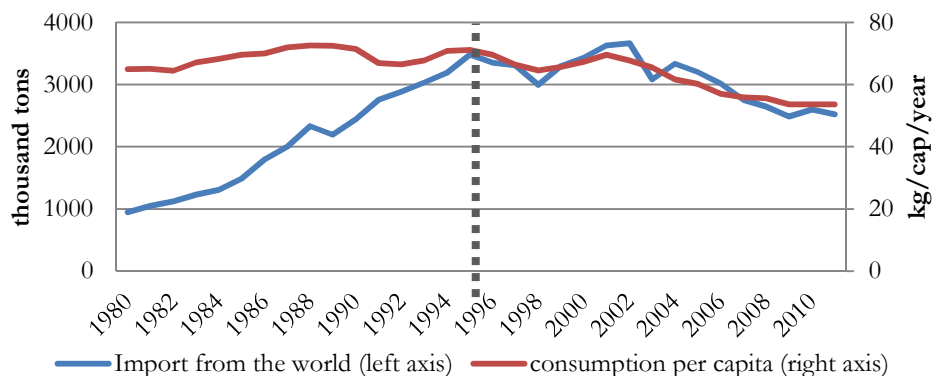
Besides the trade barrier which imposed by the destination countries, exports are also adequately influenced by the demand of importers. Considering that condition, consumption per capita of the importers will firstly observed.

After the ratification of the SPS Agreement in 1995, the member countries begin to notify its SPS measures to the WTO, including measures relating to food safety. As a part of inventory based approach, SPS notification can be used as an indicator to predict the level of SPS management as what was done by Fontagne et al (2005) and Anders and Wenstra (2012). It contains information about the prevailing standard that may restrict trade in the imposing countries (Jongwanich 2005). Therefore, a country's concern in food safety can be seen from the number of notified regulations that imposed to control the safety and hygiene of their food. For this purpose, the relation between number of measures related to food and exports is observed.

#### 4.1.1. Japan

Figure 4.2 shows Japan's import of fisheries and consumption per capita. Fisheries import of Japan had lowering growth since 1996 after the establishment of SPS agreement. There were decreasing in both trade volume and consumption per capita in 1998 when Asian crisis surged and commodity prices declined.<sup>15</sup> Although imports were decreased after the implementation of SPS agreement in 1995 and Food Safety Basic Law in 2003, it cannot be certain that the decline in imports was caused by this regulation. Import trends that have the same pattern with per capita consumption shows how Japan import of fisheries is strongly influenced by its demand of fisheries.

**Figure 4.2.** Japan's fisheries import quantity and consumption per capita

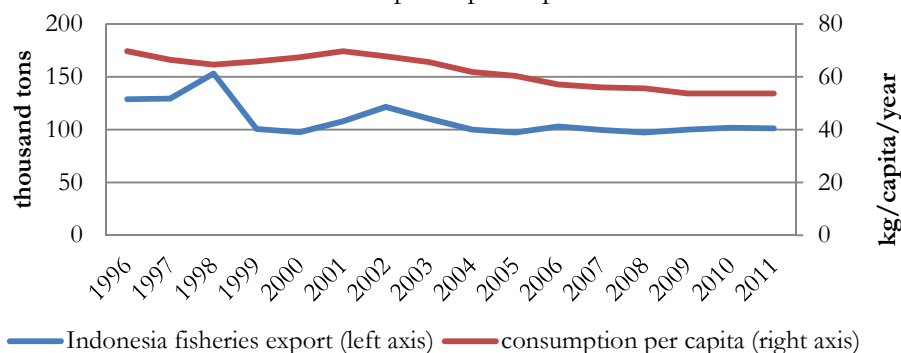


1995: The establishment of SPS agreement

Source: Own illustration based on FAO database.

The relation between Indonesia's exports of fisheries and Japan consumption per capita is shown in Figure 4.3. Decreasing pattern in both variables pointing out that decline in fisheries exports to Japan is associated with a reduction in per capita consumption of fisheries in Japan.

**Figure 4.3.** Indonesia's fisheries exports to Japan in term quantity and Japan's consumption per capita

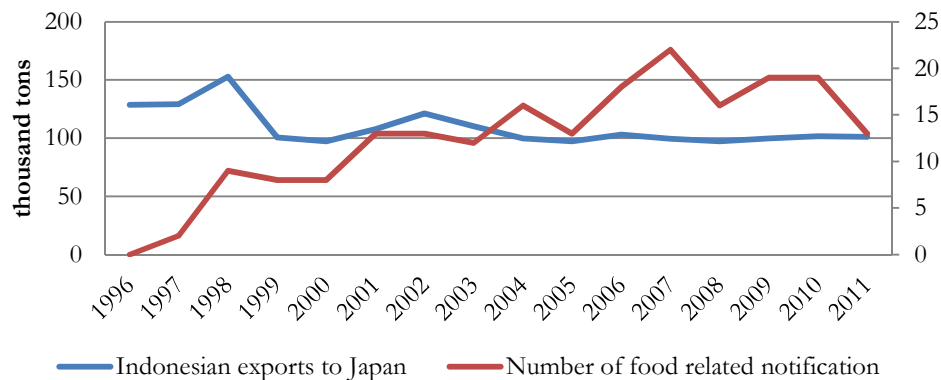


Sources: Own illustration based on Data and Information Centre Ministry of Trade Republic of Indonesia and FAO database.

<sup>15</sup> WTO Press Release PRESS/128 16April 1999.  
<[https://www.wto.org/english/news\\_e/pres99\\_e/pr128\\_e.htm](https://www.wto.org/english/news_e/pres99_e/pr128_e.htm)> (accessed July 2015)

Generally, the value of imported fisheries of Japan has contradictory behaviour compared to the reported notification number as seen in Figure 4.4. In the first few years since the existence of the SPS agreement in 1995, the increasing concern of food safety issues was in line with the decline of exports. The exports decline also accompanies the escalation of notification number in 2003. This year was also the initial implementation of basic food safety law in Japan. Great numbers of SPS measures are notified by Japan in 2007 together with the exports reduction in the same year. This negative relationship continuously happened between exports volume of Indonesia's fisheries and the number of measures that have been notified by Japan to the WTO. Therefore, besides the lowering demand of fisheries, the weakening of Indonesia's exports in the last ten years also can be caused by the increasing of Japan's concern on food safety.

**Figure 4.4.** Indonesia's fisheries exports to Japan and Japan's food regulations after the establishment of SPS agreement



Sources: Own illustration based on Data and Information Centre Ministry of Trade Republic of Indonesia and WTO database.

#### 4.1.2. United States of America (US)

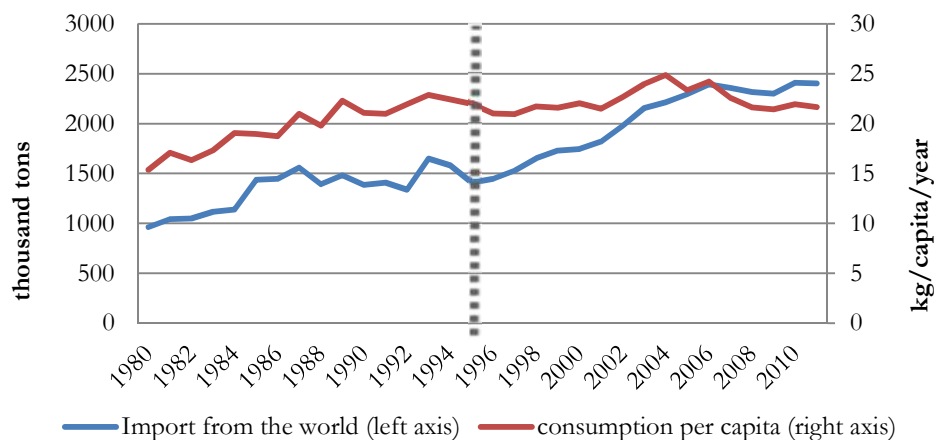
Figure 4.5 shows fisheries import quantity and consumption per capita. The decline in import volume in 2009 that also happened in almost all of the countries' trade performance was more due to global economic crises. Between 1987 and 1992, a small decline in import volume occurred, which was caused by the plentiful of US fisheries production which placed US fisheries in its self-sufficient level as explained in the previous chapter. No shock indicated after the enactment of the SPS agreement and Sanitary Procedures of Imported Fish Products in 1995 and during or after the Pre-Shipment Regulation implemented in 2003. Import of fisheries was keep increasing although per capita consumption of US relatively stable. The decline in US domestic production of fisheries was responsible to this condition. Big demand of fisheries was supported by importing it from abroad.

Despite a drastic reduction of the import of US fisheries in 2009, SPS measures are not really responsible in this case considering the global crisis that took place in this year. The adopted regulations seem did not give negative impact to import. Import especially from developing countries grew to meet high fisheries demand of the US. It forced exporting countries to keep expanding its market share, although many small exporters that cannot comply with the re-



quirements faced detention when entering US market as founded by Anders and Westra (2012).

**Figure 4.5.** US' fisheries import quantity and consumption per capita

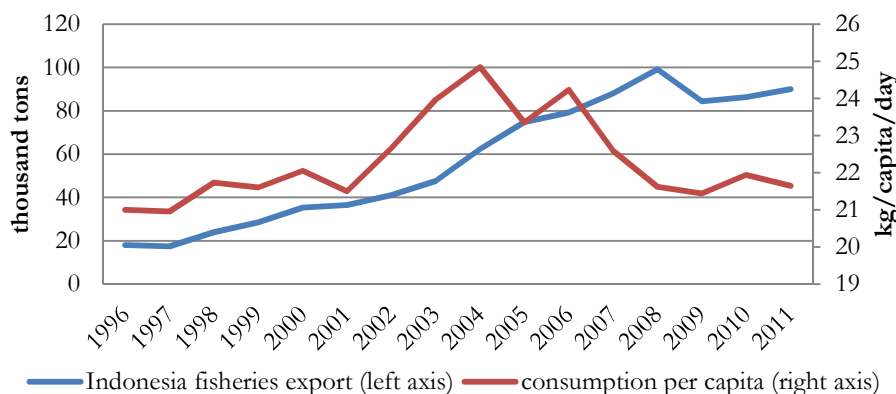


1995: The establishment of SPS agreement

Source: Own illustration based on FAO database.

Figure 4.6 presents the trend of Indonesian fisheries exports and consumption level in the US. Indonesia's exports of fisheries seem not influenced by the consumption level of US population. Exports trend was keep increasing even though US per capita consumption was declining in 2007 as shown in the figure.

**Figure 4.6.** Indonesia's fisheries export quantity of to the US and US' consumption per capita

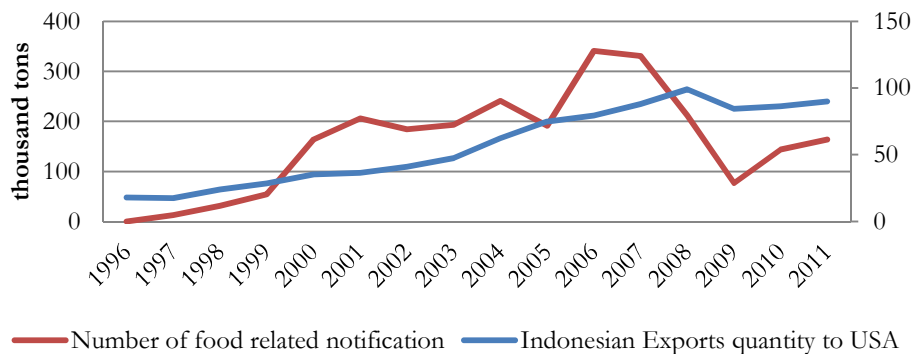


Sources: Own illustration based on Data and Information Centre Ministry of Trade Republic of Indonesia and FAO database.

Figure 4.7 shows the chart of Indonesia's fisheries exports to the US and US' food regulations notified to the WTO. On average, fisheries imports by the US and the number of notifications do not show the contradictory behaviour like in Japan. There seems to be no consistent correlation between these two variables as well. Although there was fluctuation in the number of measures, the trend of US' import was increasing. It can be seen that US concern on food safety not significantly affected Indonesia's fisheries exports to the US. Both the level of food safety management and Indonesia's exports to the US indi-

cates a trend that was likely to increase. The reduction in exports to the US were more drastic in 2009 due to the declining of per capita consumption and global economic crisis.<sup>16</sup>

**Figure 4.7.** Indonesia fisheries exports to the US and US' food regulations after the establishment of SPS agreement

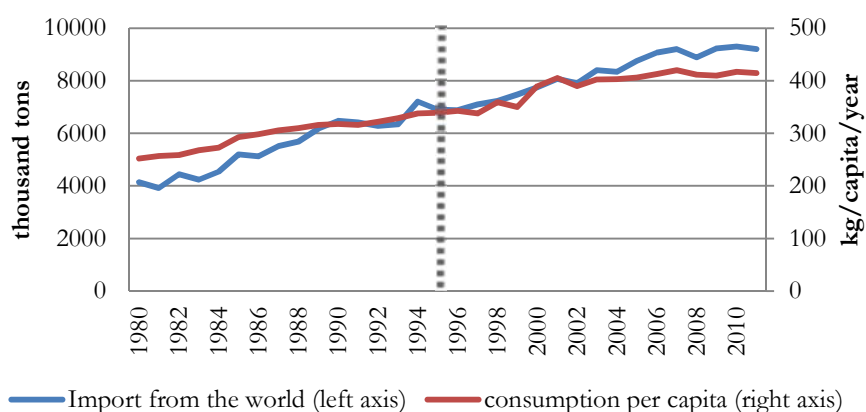


Sources: Own illustration based on UN Comtrade and WTO database.

#### 4.1.3. European Union (EU)

Figure 4.10 shows the upward trend of the EU fisheries imports and EU consumption per capita. Increase in import of fisheries in line with the increase in per capita consumption of EU's population. Decline in EU's fisheries self-sufficiency between 1999 and 2012 as reported by Palin et al (2013), lead to EU import dependency to meet the demand of fisheries. Slightly decline in import values occurred in 2009 because of the hit due to European crisis which has affected to the weakening of EU trade performance (Curran 2009). The application of food SPS measures in 1995 and food safety regulations in 2002 and 2004 did not have any negative impact on the EU total imports.

**Figure 4.8.** EU's fisheries import quantity and consumption per capita

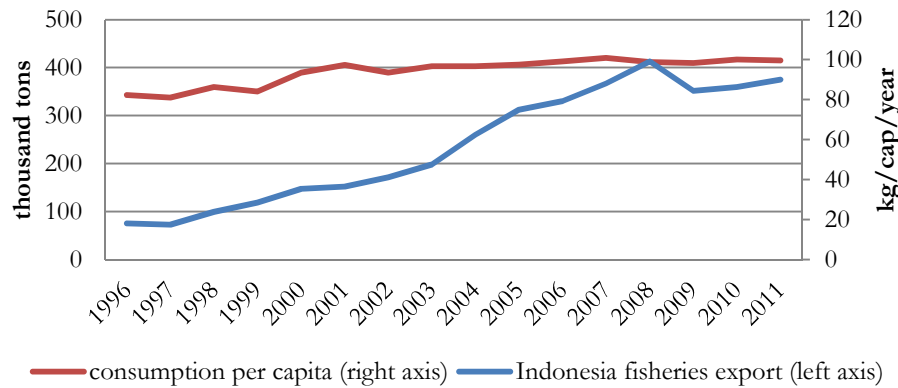


Source: own illustration base on FAO database.

<sup>16</sup> National Oceanic and Atmospheric Administration of United States (2010). [http://www.noaa.gov/stories2010/20100909\\_consumption.html](http://www.noaa.gov/stories2010/20100909_consumption.html) (accessed June 2015)

Figure 4.9 presents the trend of Indonesian fisheries exports and consumption level in the EU. Indonesia exports of fisheries keep increased after the implementation of SPS measures while the consumption level of EU population just remain stable. Increasing in imports was due to the decrease of the EU's domestic production of fisheries.

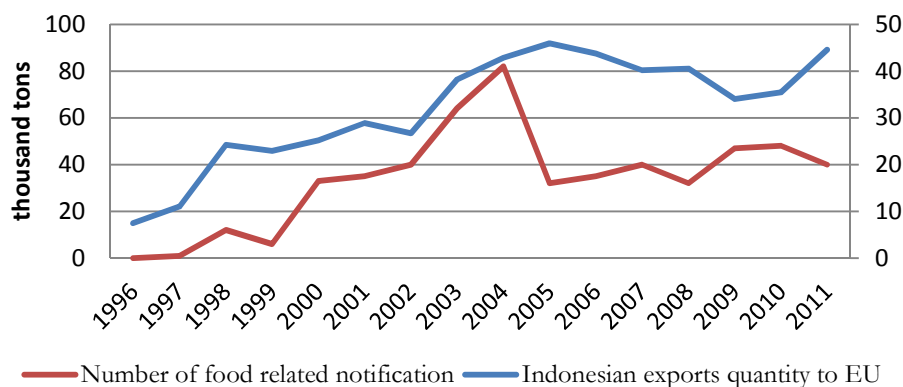
**Figure 4.9.** Indonesia's fisheries export quantity to EU and EU's consumption per capita



Sources: Own illustration based on Data and Information Centre Ministry of Trade Republic of Indonesia and FAO database.

Observing the number of measures in food that notified by EU to the WTO in figure 4.10, there is an increasing trend of Indonesia's fisheries exports to the EU since the application of the SPS agreement in 1995. There is also a significant increase in the number of notifications in the period after the implementation of food regulation in 2002 and 2004, as an effort to support the policies. The same direction between import volume and the notification number indicates that the level of food safety management in the EU in line with the fisheries exports behaviour of Indonesia to the EU.

**Figure 4.10.** Indonesia's exports of fisheries to EU and EU's food regulations after the establishment of SPS agreement



Sources: Own illustration based on UN Comtrade and WTO database.

#### 4.1.4. Discussion

Between 1996 and 2011, the linkage between food safety measures imposed by an importing country and the value of exports which presented in Table 4.1 is various in every country. This correlation coefficient can interpret how sufficient is food regulation notified by importing country explain the behaviour of Indonesia's fisheries export quantity. Negative association between food safety measures and exports occurred in Japan where 57.71% of export value explained by the amount of notified food regulation. Meanwhile, the higher value of the correlation coefficient and positive association was shown by the USA and EU. The increasing number of notifications by USA and EU were likely more in line with the increase of export quantity to these countries. Food regulations were notified by US gives effect as much as 61.89% to the export quantity of Indonesia's fisheries. While in the EU, there is 72.39 % correlation between the rising in food-related between notification and the increase in exports volume.

On the other hand, in the same period, the fisheries demand which indicated by per capita consumption of importing countries was also influences the falling in Indonesia's exports of fisheries. In Japan, 50.1% of consumption per capita had the similar behaviour with export quantity. While the demand of fisheries in the US had very small correlation with exports, The raising in consumption per capita in the EU highly correlated with increasing per capita consumption, which about 86.2%.

**Table 4.1.** Correlation coefficient of Indonesia's fisheries exports with respect to food safety measures and consumption per capita between 1996 and 2011

No	Country	Correlation coefficient between importers food safety measures and exports of fisheries	Correlation coefficient between importers consumption per capita and exports of fisheries
1	Japan	-57.71 %	50.10%
2	USA	61.89 %	27.75%
3	EU	72.39 %	86.20%

*Sources: Own calculation based on WTO and UN Comtrade.*

Although not very significant, negative correlation between Japanese food safety measures and Indonesia's exports shows that the weakening of exports volume coincided with the increasing number of food safety measures. Besides, The lowering demand of fisheries as what happened in Japan that started in the early 2000s also caused the decline of export quantity of Indonesia in that period.

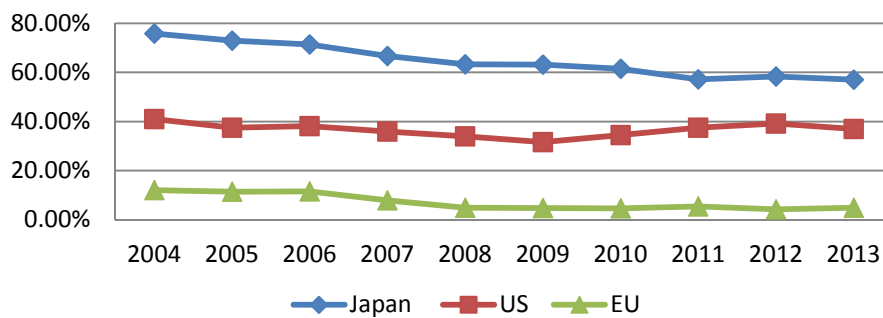
In conclusion, food safety measures in Japan still indicate negative correlation on Indonesia's exports of fisheries, while in the US and EU negative effects of the measures are not seen. However, from the observation, the demand of fisheries in the main destination countries also influences fisheries exports.

## **4.2. Restrictions caused by Food Safety Measures in the Importing Countries**

Even though importers' demand influenced Indonesia's exports of fisheries adequately, implementation of food safety measures in the importing countries still affects Indonesia's fisheries export. The food safety measures in the importing market tend to give problems to Indonesian fisheries when food safety cases are still suffered by Indonesian fisheries. To provide more information about the effect of food safety measures to Indonesia's exports of fisheries, other information is used to draw a better understanding about the consequences of the measures on fisheries exports. The problems caused by the measures that may interrupt the export flows are analyzed in this section. Frequency of detention caused by violation in food safety can represent the form of manifestation of SPS measures implementation. The food safety violation in the border recorded by FDA of the US and Ministry of Health, Labour and Welfare (MHLW) of Japan while EU by its RASFF not only recorded the violation at the border, but it also recorded the food alert that exists in the market. Hence, this observation is conducted to get a more obvious view about the potency of food safety measures as a part of SPS in affecting fisheries exports.

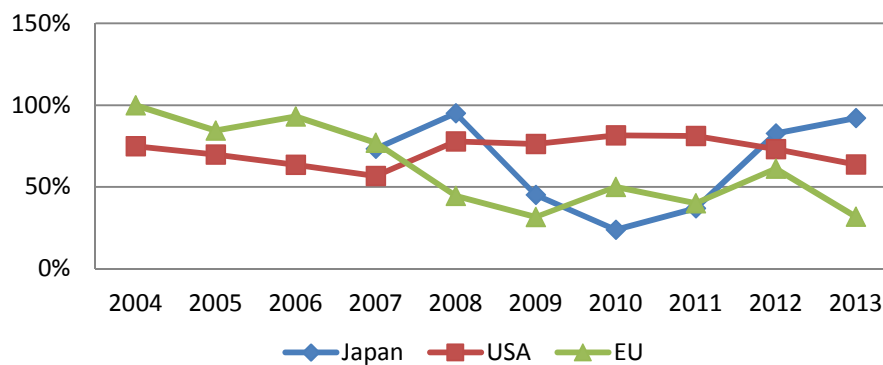
Figure 4.11 and 4.12 illustrate the trend of percentage value of fisheries exports from total food and agricultural exports and food safety cases faced by fisheries from total Indonesian food detention cases. The contribution of fisheries to food safety cases in Japan was fluctuated and tended to increase in the last four years, when fisheries portion in food and agricultural exports to this country did not show significant change. Share of cases faced by fisheries exports was high in the US which about 80% in the last decade. Although the decline of food safety cases which caused by fisheries coincided with the slightly decrease of the fisheries exports share of Indonesia to EU, the decline of the fisheries portion in detention cases was still more significant. When exports share of fisheries did not experience significant changes, fisheries portion in food safety cases fluctuates with the different trends in each importing country. The amount of food safety cases suffered by fisheries, indicate that fisheries product faced restrictions in the border.

**Figure 4.11.** Share of fisheries exports from total food and agricultural exports of Indonesia.<sup>17</sup>



Source: UN Comtrade database.

**Figure 4.12.** Portion of fisheries cases from total Indonesia's food safety cases in destination countries



Sources: Own illustration based on WTO data and MHLW of Japan, FDA of the USA, and RASFF of the EU.

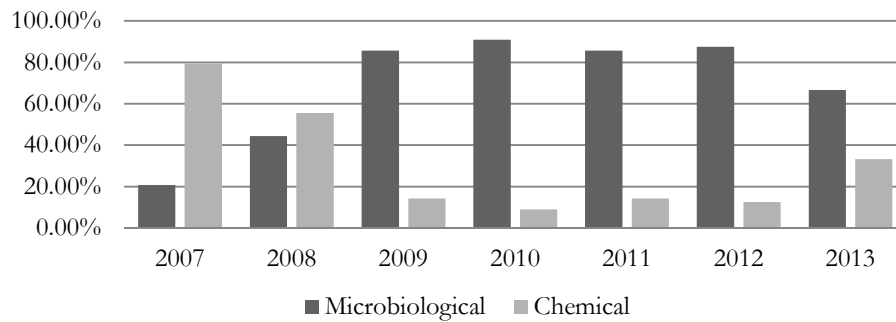
On average, Indonesian fisheries contributed 64% to total food safety cases which faced by Indonesia's export commodities exported to Japan in period between 2007 and 2013. The number of refusal cases experienced by Indonesia's fisheries products in the US was also very big. Averagely it had more than 72% of the total case between 2004 and 2013. There was significant number of the food safety cases suffered by fisheries products that had been listed in the EU-RASFF in the same period. It informed that 61% of the total food safety cases were faced by Indonesian fisheries. The big percentage value of food safety cases on fisheries shows that Indonesian fisheries product is a product which highly affected by the measures imposed by these import destinations than other food and agricultural products.

Figure 4.13 to 4.15 notify the sources of food safety cases faced by Indonesian fisheries in destination countries. That Indonesian fisheries experienced differ-

<sup>17</sup> The presented percentage values are the share of fisheries exports value from total exports value of food and agricultural commodity. Food and agricultural commodities in the calculation are the commodities that affected by the food safety measures applied by importing countries (see appendix 2)

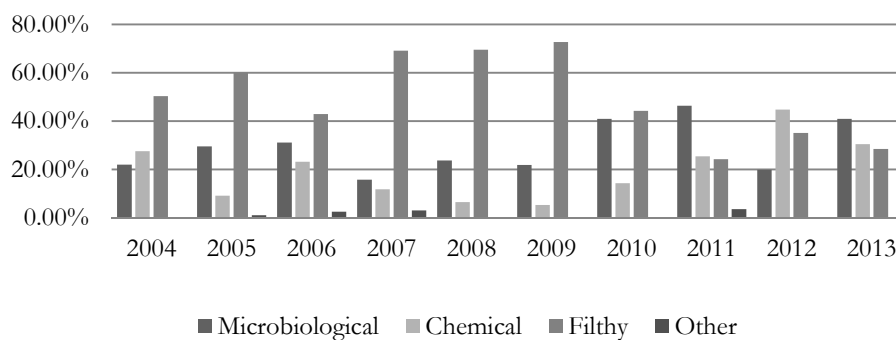
ent food safety cases in each importing country is showed in the figures. The differences were because every country applying food safety measures with dissimilarity in type, stringency level, and also in the number of measures (Ababouch et al 2005).

**Figure 4.13.** Sources of food safety cases faced by Indonesia's fisheries in Japan



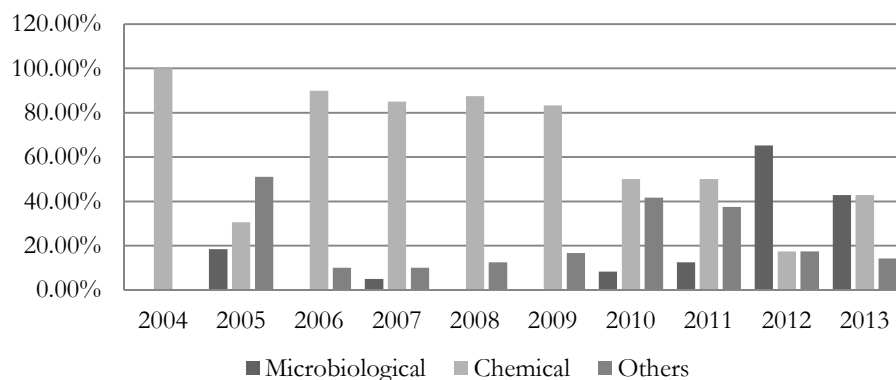
Source: Japan MHLW database.

**Figure 4.14.** Sources of food safety cases faced by Indonesia's fisheries in the US.



Source: US FDA.

**Figure 4.15.** Sources of food safety cases faced by Indonesia's fisheries in EU



Source: EU RASFF database.

Violation diversity in food safety is seen in the graphs where the dominant food safety cases were different from each other. According to Ababouch et al (2005), the differences depend on imported fisheries products and also more due to the priority of handling, testing and recording procedures for imported goods which conducted differently. For examples, based on MHLW import notification data, the source of border cases on fisheries in the last five years is microbiological contamination. The stringency of microbiological requirements in Japan is because of the behaviour of Japanese people who consume raw fish frequently with a great quantity. Thus, the greater health problems caused by microbiological contamination will be more serious for raw fish eaters. Fewer rejection caused by chemical content was not because it does not give problems to Japanese consumer, it may be more caused by the differences in priorities in the inspection practice. Different violations were noted in the US and EU. Filthy in fisheries became the main causes of detention in the US while chemical matters as the reason of alert in the EU for the last ten years. Filthy that becomes the reason of fisheries import detention in the US is physical damage that can be detected directly which indicates the product's impropriety as human consumption. Besides chemical content and microbiological contaminant, physical condition of fisheries product is the required parameters in the importing countries as well.

#### **4.2.1. Discussion**

In the recent years, the contribution of fisheries to food safety cases faced by Indonesia in US and EU border was decrease while fisheries exports portion did not show the significant change. The contribution of fisheries to food safety cases in Japan increased while the exports share of fisheries remains stable. Although the negative effects of food safety measure on exports are not seen in the US and EU, the application of food safety measures still gives problems to fisheries sector. Detention to a number of fisheries products from Indonesia in the recent years indicates that the flows of fisheries export have been disrupted. When there is no information about whether the product that experienced detention can be disposed or re-enter the trade flow, the effect of detentions on the export quantity could not be concluded. These export detention cases inform that Indonesia's fisheries still faced the restriction problem caused by the food safety measures implementation.

As the solution, better standard harmonization could assist exporting countries to comply with the requirements from developing countries (Ababouch et al 2005). Along with high level of development and high demand for safer food, developing countries have already been more aware in the field of food technology. These countries then became novice in applying food quality and food safety system. The trading partners can adopt their food safety system in order to ensure food safety of the exports products. This situation leads to harmonization in food safety standards that would encourage an increase in the safety level of traded food. The ability to comply with food safety measures will reduce the barriers faced by fisheries exports, so the efforts to increase exports can be done efficiently. To cope with it, the food safety system of the importing countries was adopted by Indonesia's government. Specific regulations related to quality assurance of fish and fish products are also applied to address EU requirements in fisheries and to support EC provision that placed Indone-



sia as one of the countries which its imports of fishery products is authorized for human consumption as reported by Ababouch (2005).

Consistency in applying the standard of food safety practices in the handling of fisheries products will serve to eliminate the restriction problems. Government's active role in ensuring the implementation of standards of food safety practices can be done in various ways. For instance, the government can help new comers to achieve the required food safety standards. Secondly, government can also provide incentives or rewards to the producers or exporters who consistently enforce standards for food safety in their products. Oppositely, the sanctions can be given to exporters who do not consistently comply with the prevailing regulations.

## Chapter 5

### Conclusion and Policy Implication

The objective of the research is to analyse to what extent food safety measures implementation by the main destination countries affects Indonesian fishery exports. The fact that the United States of America (USA), Japan and EU are the main import destinations makes those food safety measures that are consistently applied in these countries may affects the fisheries exports performance of Indonesian fisheries. The presence of negative effect of food safety measures to exports performance is noticeable in the rising of SPS notification related to food safety. In Japan, US and EU, food safety measures dominate the SPS measures which have been notified to the WTO. In the period 1995 and 2014 Japan's actual SPS notification related to food regulation is about 72% from the total SPS notification. The US and EU have the big share of food regulations as well, when 78% from total notification was addressed to food regulations in the US and 73% in the EU. It shows how food safety measures in these countries will be able to affect food Exports of Indonesia.

Japan, US and the EU have high fish consumption but face falling in fisheries production capacity due to the reduced fishing area and environmental reasons. Therefore, they need to import fish and fishery products from developing countries. The increase in fisheries exports of developing countries also supported by the increasing of fisheries production especially from its aquaculture sector (FAO 2014). The great flow of fisheries exports from developing countries to developed countries and the food safety measures implemented by developed countries have greatly affected fisheries products of developing countries. Because the demand of fisheries was also influences the trend of imports in Japan, US and EU, then the analysis need to incorporate consumption per capita to improve the observation. Then, inventory data that consist of the number of food safety regulation and border detention are observed to capture the influence of food safety measures to fisheries export quantity.

The result suggests that even not significant, the food safety measures negatively influence fisheries exports to Japan. In addition, the lowering demand of fisheries as what happened in Japan since the early of 2000s also caused the decline of fisheries export quantity to Japan and the stagnant of Indonesia's export performance in that period. However, the negative effects are not seen in Indonesia's fisheries exports to the US and EU. There was no negative correlation between food safety measures implementation and exports to the US and EU. Exports of fisheries to these destinations were increasing although the number of food safety measures increased. The huge escalation of the consumer demand in these countries also played a role in the fisheries exports enhancement.

Japan is the main destination country, which imported about 30% of Indonesian fisheries in period between 2000 and 2013. Therefore, a large decline of fisheries exports to this country will reduce Indonesia exports of fisheries significantly. The similar effect will occur, if exports performance to US and EU falls down. Thus, positive improvement of Indonesian fisheries that comply

with importers standard will overcome the restriction problems faced by Indonesia's trade sector. Because, the contribution of fisheries sector to Indonesian GDP and to income enhancement of fisheries household increases, it then encourages the improvement of Indonesia's economy.

Thereafter, the enactment of food safety measures in the form of border inspection and examination towards imported products are useful give more understanding about the restriction caused by the measures to fisheries exports. This additional analysis presents that in the recent years, the food safety measures in the importing markets are most likely giving a number of problems to Indonesian fisheries exports. The great portion of food safety cases was suffered by fisheries in the last decade. In the recent years, the contribution of fisheries to food safety cases was slightly decline in the US. There was more significant fall of fisheries portion in the EU border cases while exports share of fisheries did not show the significant change. On the other hand, the contribution of fisheries to food safety cases in Japan increased while the exports share of fisheries remains stable. Hence, the implementation of food safety measures still becomes the problems to fisheries sector. Although the effect of detentions on the export quantity could not be accurately concluded due to the data limitation, detention that suffered by a number of fisheries product certainly gives certain disadvantage. If not addressed adequately, this condition will be able to aggravate exports performances of Indonesian fisheries.

Meanwhile, different in sources of food safety cases that was experienced depends on the type of fisheries products, priority of handling, and it also depends on testing and recording procedures. The diversity of consumer behaviour, food safety trend of today consumers, food safety risks and recent health problems caused by food also develop variation in the concern of food safety (Buzby and Unnevehr 2003 and Ababouch et al 2005). Therefore, good bilateral relations and mutually reinforcing with trading partners will bring ease to face of food safety measures in importing countries (Mitchell 2003, Ababouch et al 2005, Jongwanich 2009).

Better standard harmonization could assist Indonesia to comply with the requirements from developing countries. Adopting the food safety measures which are equivalent to the importing countries standards encourages Indonesia improvement in food safety practices. The good food safety practices in fisheries sector is expected to anticipate the demands of international consumers and overcome trade barriers in the fisheries sector. Actually, regulations relating to food safety that affect fisheries products have been assigned since 2002. These regulations were made by considering the standard of food safety practices that applied internationally. Thus, the effectiveness of the regulation now is very dependent on the consistency in its implementation.

## References

- 'Forum Ekonomi Dunia Jadi Ajang Mendag Naikkan Ekspor 300%' (2015)  
Accessed April 2015  
<[http://dipen.kemendag.go.id/app\\_frontend/accepted\\_rsses/view/552775ad-6084-401e-8ddb-085dc0a83502](http://dipen.kemendag.go.id/app_frontend/accepted_rsses/view/552775ad-6084-401e-8ddb-085dc0a83502)>
- 'Tanpa Transshipment, Target Ekspor Hasil Laut Bisa Meningkatkan' (2015)  
Accessed April 2015 <<http://kkp.go.id/index.php/berita/tanpa-transshipment-target-ekspor-hasil-laut-bisa-meningkat/>>
- Ababouch, L., G. Gandini and J. Ryder (2005) *Causes of Detentions and Rejections in International Fish Trade*.
- Alaeibakhsh, S. and Z. Ardakani (2012) 'Quantifying the Trade Effects of SPS and TBT Agreements on Export of Pistachios from Iran', *World Applied Sciences Journal* 16(5): 637-641
- Allshouse J., J. C. Buzby, D. Harvey and D. Zorn (2003) 'International Trade and Seafood Safety', *USDA Agricultural Economic Report (AER): International Trade and Food Safety Economic Theory and Case Studies* AER-828: 1-9
- Anders, S.M. and S. Wenstra (2012) 'Barriers to Fishery Exports from Developing Countries: The Impact of U.S. FDA Food Safety Regulation', selected paper prepared for presentation at the International Association of Agricultural Economists (IAAE) Triennial Conference, Foz do Iguaçu, Brazil (18-24 August, 2012). Accessed June 2015  
<<http://ageconsearch.umn.edu/bitstream/126912/2/Westra.pdf>>
- Antara (2015) 'Target Ekspor Perikanan 2015 Dinilai Tak Realistis', *Metrotvnews.com* 20 January. Accessed April 2015  
<<http://ekonomi.metrotvnews.com/read/2015/01/20/347451/target-ekspor-perikanan-2015-dinilai-tak-realistis>>
- Ardakani, Z., S. Yazdani and O. Gilanpour (2009) 'Studying the Effects of Non-Tariff Barriers on the Export of the Main Agricultural Products of Iran', *American Journal of Applied Sciences* 6(7): 1321-1326
- Bagumire, A., E. C. D. Todd, G. W. Nasinyama and C. Muyanja (2010) 'Food Safety regulatory Requirements with Potential Effect on Exports of Aquaculture Products from Developing Countries to the EU and US', *African Journal of Food Science and Technology* 2(1): 31-50
- Bao, X. And Qiu, L. D. (2010) 'Do Technical Barriers to Trade Promote or Restrict Trade? Evidence from China', *Asia-Pacific Journal of Accounting and Economics* 17: 253-280
- Beghin, J. C. and J. C. Bureau (2001) 'Measurement of Sanitary, Phytosanitary and Technical Barriers to Trade', Organisation for Economic Co-operation and Development (OECD). Accessed June 2015 <<http://www.oecd.org/tad/agricultural-trade/1816774.pdf>>

Beghin, J., A. Disdier, S. Marette and F. Van Tongeren (2012) 'Welfare Costs and Benefits of Non-Tariff Measures in Trade: A Conceptual Framework and Application', *World Trade Review* 11(3): 356-375.

Buzby, J. C. and L. Mitchell (2006) 'Private, National, and International Food Safety Standards', *Journal of Food Distribution Research* 37(1): 7-12

Buzby, J. C. and L. Unnevehr (2003) 'Introduction and Overview', *USDA Agricultural Economic Report (AER): International Trade and Food Safety Economic Theory and Case Studies* AER-828: 1-9

Centre of Data Statistics and Information Ministry of Marine Affairs and Fisheries Republic of Indonesia (2012) *Marine and Fisheries Statistics Book*, Ministry of Marine Affairs and Fisheries Republic of Indonesia

Centre of Data, Statistics and Information Ministry of Marine Affairs and Fisheries (2013) 'Marine and Fisheries in Figures 2013'. Jakarta: Ministry of Marine Affairs and Fisheries

Centre of Data, Statistics and Information Ministry of Marine Affairs and Fisheries (2014) 'Marine and Fisheries in Figures 2014'. Jakarta: Ministry of Marine Affairs and Fisheries

Chandra, W. (2012) 'The impact of Dependency on Primary commodity on Indonesia Economic Growth', MA thesis. The Hague: Institute of Social Studies.

Codex Alimentarius (n.d.) 'About Codex'. Accessed March 2015  
<<http://www.codexalimentarius.org/aboutcodex/en/>>

Curran, L. (2009) 'The Impact of the Financial and Economic Crisis on World Trade and Trade Policy' *Intereconomics* September/October 2009: 264-293

Dahar, D., R. Oktaviani and W. Rindayati (2014) 'Analisis Pemberlakuan *Non Tariff Measures* (NTM) pada ekspor hortikultura Indonesia ke ASEAN +3', *Bina Ekonomi Majalah Fakultas Ekonomi Unpar* Vol. 98 18, No. 1, January 2014

Efendi, Y. And Yusra (2012) *Pengendalian Mutu Hasil Perikanan*, pp167-184. Fakultas Perikanan dan Ilmu Kelautan Universitas Bung Hatta. Accessed May 2015<[http://fpik.bunghatta.ac.id/files/downloads/Ebook/Pengendalian%20Mutu%20Hasil%20Perikanan/bab\\_8\\_hukum\\_dan\\_kebijakan\\_mutu\\_hasil\\_perikanan.pdf](http://fpik.bunghatta.ac.id/files/downloads/Ebook/Pengendalian%20Mutu%20Hasil%20Perikanan/bab_8_hukum_dan_kebijakan_mutu_hasil_perikanan.pdf)>

Fakhrudin, U. (2008) 'Kebijakan Hambatan Perdagangan atas Produk Ekspor Indonesia di Negara Mitra Dagang', *Buletin Ilmiah Litbang Perdagangan* Vol. 2, No. 2 2008: 216-236

Filho, P., M. Xavier, M. Barosso, R. V. Flores, and R. Manolio (2014) 'Effects of Non-Tariff Barriers on Brazilian Fisheries Exports to the European Union', *AGROLIMENTARIA* Vol. 20, No. 39, July-December 2014: 35-52

- Fitriani, F. F. (2015) 'Target Ekspor: Mendag Pancang 300%, Menteri Susi Siap di Angka 100%', *Bisnis.com* 27 Jnuary. Accessed April 2015  
<<http://industri.bisnis.com/read/20150127/12/395830/ekspor-perikanan-mendag-pancang-300-menteri-susi-siap-di-angka-100>>
- Fontagne, L., M. Mimouni and J. M. Pasteels (2005) 'Estimating the Impact of Environmental SPS and TBT on International Trade', *Integration and Trade Journal*, Vol. 22, No.3: 7-37
- Food and Agriculture Organization (n.d.) 'National Aquaculture Legislation Overview Indonesia' Accessed April 2015  
<[http://www.fao.org/fishery/legalframework/nalo\\_indonesia/en](http://www.fao.org/fishery/legalframework/nalo_indonesia/en)>
- Food and Agriculture Organization (n.d.) 'National Aquaculture Sector Overview Indonesia' Accessed March 2015  
<[http://www.fao.org/fishery/countrysector/naso\\_indonesia/en](http://www.fao.org/fishery/countrysector/naso_indonesia/en)>
- Food and Agriculture Organization (n.d.) 'National Aquaculture Sector Overview United States of America' Accessed April 2015  
<[http://www.fao.org/fishery/countrysector/naso\\_usa/en](http://www.fao.org/fishery/countrysector/naso_usa/en)>
- Food and Agriculture Organization (n.d.) 'National Aquaculture Sector Overview Japan' Accessed April 2015  
<[http://www.fao.org/fishery/countrysector/naso\\_japan/en](http://www.fao.org/fishery/countrysector/naso_japan/en)>
- Food and Agriculture Organization (2009) 'National Fishery Sector Overview Japan'. Accessed May 2015  
<[ftp://ftp.fao.org/Fi/DOCUMENT/fcp/en/FI\\_CP\\_JP.pdf](ftp://ftp.fao.org/Fi/DOCUMENT/fcp/en/FI_CP_JP.pdf)>
- Food and Agriculture Organization (2014) 'The State of World Fisheries and Aquaculture: Opportunities and Challenges'. Rome: Food and Agriculture Organization of the United Nations
- Food and Agriculture Organization (n.d.) 'National Aquaculture Legislation Overview Japan'. Accessed April 2015 <[http://www.fao.org/fishery/legalframework/nalo\\_japan/en](http://www.fao.org/fishery/legalframework/nalo_japan/en)>
- Fugazza, M. (2013) 'The Economic Behind Non-Tariff Measures: Theoretical Insight and Empirical Evidences' Policy Issues In International Trade and Commodities Study Series No. 57. New York: UNCTAD
- Gebrehiwet, Y., S. Ngqangweni & J.F. Kirsten (2007)'Quantifying the Trade Effect of Sanitary and Phytosanitary regulations of OECD Countries on South African Food Exports' *Agrekon*, Vol.7, No.1: 23-39
- Guillotreau P. And N. Péridy (2000) 'Trade Barriers and European Imports of Seafood Products: aA Quantitative Assesment' *Marine Policy* (24): 431-437
- Hartwig, F. and B.E. Dearing (1979) *Exploratory Data Analysis: Frederick Hartwig ; with Brian E. Dearing*. Vol. no. 07-016. Beverly Hills, CA [etc.]: Sage Publications.

Henson, S. and R. Loader (2001) 'Barriers to Agricultural Exports from Developing Countries: The role of Sanitary and Phytosanitary Requirements', *World Development*, Vol. 1, PP. 85-102

Henson, S. and R. Loader (image) (2001) Accessed March 2015  
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.460.8369&rep=rep1&type=pdf>

Hollis, D. (2010) 'United Nations Convention on Law of the Sea (UNCLOS), 1982', *The Encyclopedia of Earth* 22 June. Accessed July 2015  
<<http://www.eoearth.org/view/article/156775/>>

Indonesia Investment Coordination Board (2011) 'Fishery Industry at a Glance'. Accessed February 2015  
<<http://www.bkpm.go.id/img/file/fisheries.pdf>>

Indonesia's Marine and Fisheries Statistics, The Ministry of Marine Affairs and Fisheries Republic of Indonesia <<http://www.statistic.kkp.go.id>>

Indonesian Investment and Coordinating Board (n.d.) 'Fisheries Industries at a glance' Accessed March 2015  
<<http://www.bkpm.go.id/img/file/fisheries.pdf>>

Indonesian Ministry of Trade (n.d.) '10 main and potential commodities' Accessed March 2015 <<http://www.kemendag.go.id/en/economic-profile/10-main-and-potential-commodities>>

Jongwanich, J. (2009) 'The impact of food safety standards on processed food exports from developing countries', *Food Policy* 34 (2009): 447–457

Jonker, T. H., H. Ito, H. Fujishima (2005) 'Food Safety and Quality Standards in Japan Compliance of Suppliers from Developing Countries', *The World Bank Agriculture and Rural Development Discussion Paper* . Accessed June 2015  
<<http://siteresources.worldbank.org/INTRANETTRADE/Resources/Topics/Standards/JapanCountrySurveyF.pdf>>

Kee, H. L., A. Nicita and M. Olarreaga (2006) 'Estimating Trade Restrictiveness Indices', World Bank Policy Research Working Paper No. 3840. Washington D. C.: World Bank

Li X., S. Saghaian, and M. Reed (2013) 'Differential Impacts of HACCP Systems on Trade Flows: The Case of U.S. Seafood Exports', *Economics World* Vol. 1, No. 1: 14-28

Listiani, N. (2013) 'Implementation of Export Standard in Octopus and Anchovy Fishing Companies in Kendari', *Buletin Ilmiah Litbang Perdagangan*, Vol. 7 No. 1, July 2013: 91-110

Lupien, J.R. (2002) 'The Precautionary Principle and Other Non-Tariff Barriers to Free and Fair International Food Trade', *Critical reviews in food science and nutrition* 42(4): 403-415

Ma, J. and Y. Lu (2011) 'Free Trade Or Protection: A Literature Review on Trade Barriers', *Research in world economy* 2(1): 69-76

Melo, O., A. Engler, L. Nahuehual, G. Cofre and J. Barrena (2014) 'Do Sanitary, Phytosanitary, and Quality-Related Standards Affect International Trade?: Evidence from Chilean Fruit Exports', *World Development* 54: 350-359

Marine and Fisheries statistics, Ministry of Marine Affairs and Fisheries Republic of Indonesia, <http://statistik.kkp.go.id/> (Accessed: March 2015)

Ministry of Trade Republic of Indonesia (n.d) 'the Strategic Planning of the 2010-2014'. Accessed: March 2015  
<<http://www.kemendag.go.id/files/pdf/2012/12/06/rencana-strategis-2010-2014-id0-1354733374.pdf>>

Ministry of Trade Republic of Indonesia (n.d.) '10 Main and Potential Commodities'. Accessed: February 2015  
<<http://www.kemendag.go.id/en/economic-profile/10-main-and-potential-commodities>>

Mitchell, L. (2003) 'Economic Theory and Conceptual Relationships Between Food Safety and International Trade', *USDA Agricultural Economic Report (AER): International Trade and Food Safety Economic Theory and Case Studies* AER-828: 10-27

National Oceanic and Atmospheric Administration of the United States (2010) 'U.S. Seafood Consumption Declines Slightly in 2009'. Accessed June 2015  
<[http://www.noaa.gov/stories/2010/20100909\\_consumption.html](http://www.noaa.gov/stories/2010/20100909_consumption.html)>

OECD (2012), *OECD Review of Agricultural Policies: Indonesia 2012*, OECD Publishing, Paris. <<http://dx.doi.org/10.1787/9789264179011-en>>

OECD (image) (2012) Accessed March 2015 <<http://www.oecd-ilibrary.org/docserver/download/5112101e.pdf?expires=1440119012&id=id&acname=ocid194328&checksum=A1ED4D48311F87898C275A3ACEE5B7D6>>

Organisation for Economic Co-operation and Development, OECD, Organisation for Economic Co-operation and Development and Joint Working Party on Agriculture and Trade (2003) *The Impact of Regulations on Agro-Food Trade: The Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary Measures (SPS) Agreements*. Paris: Organisation for Economic Co-operation and Development.

Painte, R. E. (2008) 'Analisis Pengaruh Hambatan Tarif dan Non Tarif di PAsar Uni Eropa Terhadap Ekspor Komoditas Udang Indonesia', Thesis. Bogor: Institute Pertanian Bogor. Faculty of Fisheries and Marine Science

Palin, C., C. Gaudin, J. Espejo-Hermes and L. Nicolaides (2013) 'Compliance of Imports of Fishery and Aquaculture Product with EU Legislation



(IP/B/PECH/IC/2012-087) '. European Parliament Directorate-General for Internal Policies, Policy Department B: Structural and Cohesion Policies: Fisheries

Pauwelyn, J. (1999) 'The WTO Agreement on Sanitary and Phytosanitary (SPS) Measures as Applied in the First Three SPS Disputes: EC - Hormones, Australia - Salmon and Japan - Varietals', *Journal of International Economic Law* 2(4): 641-664

Popescu, I. and T. Ogushi (2013) 'Fisheries in Japan' (IP/B/PECH/NT/2013-04)'. European Parliament Directorate General for Internal Policies, Policy Department B: Structural and Cohesion Policies: Fisheries

Publishing, O., N.E. Agency, gnd/5157-3, OECD and Organisation for Economic Co-operation and Development (2012) *OECD Review of Agricultural Policies: Indonesia 2012*. Paris: Organization for Economic Co-operation and Development (OECD).

Rastikarany, H. (2008) 'Analisis Pengaruh Kebijakan Tarif dan Non Tarif Uni Eropa Terhadap Ekspor Tuna Indonesia', Thesis. Bogor: Institute Pertanian Bogor. Faculty of Fisheries and Marine Science

Sunorita, M. And I. Tjarsono (2014) 'Kebijakan Hambatan Non Tarif di Pasar Uni Eropa', *Jurnal Online Mahasiswa Fakultas Ilmu Sosial dan Ilmu Politik Universitas Rian* Vol 1, No. 1. Accessed March 2015 <<http://jom.unri.ac.id/index.php/JOMFSIP/article/view/2202/2144>>

Susilowati, I. (2012) 'Menuju Pengelolaan Sumberdaya Perikanan Berkelanjutan yang Berbasis pada Ekosistem: Studi Empiris di Karimunjawa Jawa Tengah', Laporan Penelitian Universitas Diponegoro. Accessed July 2015 <[http://eprints.undip.ac.id/40899/1/abc\\_lppm\\_indah\\_hikom\\_Laporan\\_penelitian\\_hikom\\_karimun\\_2.pdf](http://eprints.undip.ac.id/40899/1/abc_lppm_indah_hikom_Laporan_penelitian_hikom_karimun_2.pdf)>

The Ministry of National Development Planning Republic of Indonesia (n.d.) 'National Medium Term Development Plan 2015-2019'. Accessed June 2015 <[http://www.bappenas.go.id/files/2514/0374/8955/PEMBANGUNAN\\_KELAUTAN\\_DAN\\_PERIKANAN\\_DALAM\\_PRIORITAS\\_PEMBANGUNAN\\_NASIONAL\\_2015-2019\\_Jakarta\\_28\\_Januari\\_2014.pdf](http://www.bappenas.go.id/files/2514/0374/8955/PEMBANGUNAN_KELAUTAN_DAN_PERIKANAN_DALAM_PRIORITAS_PEMBANGUNAN_NASIONAL_2015-2019_Jakarta_28_Januari_2014.pdf)>

Tongeren, F.v., J. Beghin and S. Marette (2009) *A Cost-Benefit Framework for the Assessment of Non-Tariff Measures in Agro-Food Trade*. Vol. No. 21. Paris: OECD Publishing.

United Nations Conference on Trade and Development (UNCTAD) (2013), 'Non-Tariff Measures to Trade: Economic and Policy Issues for Developing Countries', United Nations Food and Agriculture Organization

United Nations Industrial Development Organization (UNIDO) (2011) 'What do Border Rejections tell us about Trade Standards Compliance of Developing Countries? Analysis of EU and US Data 2002-2008', UNIDO Working Paper

Unwin, A. (2010) 'Exploratory Data Analysis', *Elsevier Ltd* : 156-161.

Walidah, E., D. Kadarisman, T. Muhandri (2001) 'A case Study of Indonesian Frozen Shrimps Export Detention by FDA (Food and Drug Administration) in 1998', *Jurnal Teknologi Pertanian* 2(3)Vol. 2, No. 3, December 2001: 117-124

World Trade Organization (1999) 'World trade growth slower in 1998 after unusually strong growth in 1997'. WTO Press Release Press/128 16 April. Accessed July 2015

<[https://www.wto.org/english/news\\_e/pres99\\_e/pr128\\_e.htm](https://www.wto.org/english/news_e/pres99_e/pr128_e.htm)>

### **Online data sources:**

FAO Fish Statistics Dataset <<http://data.fao.org/dataset-data-filter?entryId=aea93578-9b01-4448-9305-917348ca00b2&tab=data>>

FAO Statistics <<http://faostat3.fao.org>>

European Commission Food and Feed Safety Alerts Report and Publications  
<[http://ec.europa.eu/food/safety/rasff/reports\\_publications](http://ec.europa.eu/food/safety/rasff/reports_publications)>

Import Notification of the Food Sanitation Law Violation, Japan's Ministry of Health Labour and Welfare  
<<http://www.mhlw.go.jp/english/topics/importedfoods/index.html>>

Ministry of Trade Republic of Indonesia <<http://www.kemendag.go.id>>

Statistics Indonesia (BPS) <<http://bps.go.id/>>

Statistics of Indonesia's Ministry of Marine Affairs and Fisheries  
<<http://statistik.kkp.go.id>>

UN Comtrade database <<http://comtrade.un.org/>>

United States Food and Drug Administration Import Refusal Reports<<http://www.accessdata.fda.gov/scripts/importrefusals>>

World Trade Organization (n.d.) 'Current Issue in SPS'. Accessed March 2015  
<[https://www.wto.org/english/tratop\\_e/sps\\_e/sps\\_issues\\_e.htm](https://www.wto.org/english/tratop_e/sps_e/sps_issues_e.htm)>

World Trade Organization (n.d.) 'Understanding the WTO: The Agreements Standards and Safety'. Accessed March 2015  
<[https://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/agrm4\\_e.htm](https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm4_e.htm)>

WTO Integrated Trade Intelligence Portals  
<<https://i-tip.wto.org/goods/Forms/TableView.aspx>>

WTO <<https://www.wto.org>>

# Appendices

## Appendix 1

EU Members Since 1995

No	Country	Date of membership
1	Austria	1 January 1995
2	Belgium	1 January 1958
3	Denmark	1 January 1973
4	Finland	1 January 1995
5	France	1 January 1958
6	Germany	1 January 1958
7	Greece	1 January 1981
8	Ireland	1 January 1973
9	Italy	1 January 1958
10	Luxembourg	1 January 1958
11	The Netherlands	1 January 1958
12	Portugal	1 January 1986
13	Spain	1 January 1986
14	Sweden	1 January 1995
15	United Kingdom	1 January 1973

*Source: European Union Member Countries. <http://europa.eu/about-eu/countries/member-countries/> (Accessed July 2015)*

## Appendix 2

### Food and Agricultural Commodities

These commodities are Food and agricultural commodities that affected by the food safety measures applied by the importing countries and were taken into account in the figure 4.16.

No	HS code	Products
1	HS 02	Meat and edible meat offal
2	HS 03	Fish and crustaceans, molluscs and other aquatic invertebrates
3	HS 04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included
4	HS 05	Products of animal origin, not elsewhere specified or included
5	HS 07	Edible vegetables and certain roots and tubers
6	HS 08	Edible fruit and nuts; peel of citrus fruits or melons
7	HS 09	Coffee, tea, maté and spices
8	HS 10	Cereals
9	HS 11	Products of the milling industry; malt; starches; inulin; wheat gluten
10	HS 12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder
11	HS 13	Lac; gums, resins and other vegetable saps and extracts
12	HS 14	Vegetable plaiting materials; vegetable products not elsewhere specified or included
13	HS 15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
14	HS 16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates
15	HS 17	Sugars and sugar confectionery
16	HS 18	Cocoa and cocoa preparations
17	HS 19	Preparations of cereals, flour, starch or milk; pastry cooks' products
18	HS 20	Preparations of vegetables, fruit, nuts or other parts of plants
19	HS 21	Miscellaneous edible preparations
20	HS 22	Beverages, spirits and vinegar

Source: International Trade Centre. <http://www.intracen.org>

### Appendix 3

#### List of Developed Countries

*Sources: Food and Agriculture Organization*

Albania	Liechtenstein
Andorra	Lithuania
Armenia	Luxembourg
Australia	Malta
Austria	Monaco
Azerbaijan	Montenegro
Belarus	Netherlands
Belgium	New Zealand
Bosnia and Herzegovina	Norway
Bulgaria	Poland
Canada	Portugal
Channel Islands	Republic of Moldova
Croatia	Romania
Czech Republic	Russian Federation
Czechoslovakia	San Marino
Denmark	Serbia
Estonia	Serbia and Montenegro
Faroe Islands	Slovakia
Finland	Slovenia
France	South Africa
Georgia	Spain
Germany	Svalbard and Jan Mayen Islands
Gibraltar	Sweden
Greece	Switzerland
Hungary	Tajikistan
Iceland	The former Yugoslav Republic of Macedonia
Ireland	Turkmenistan
Isle of Man	Ukraine
Israel	Un. Sov. Soc. Rep.
Italy	United Kingdom
Japan	United States of America
Kazakhstan	Uzbekistan
Kyrgyzstan	Yugoslavia SFR
Latvia	

## Appendix 4

### List of Developing Countries

*Sources: Food and Agriculture Organization*

Algeria	Marshall Islands
American Samoa	Martinique
Anguilla	Mauritius
Antigua and Barbuda	Mayotte
Argentina	Mexico
Aruba	Micronesia (Federated States of)
Bahamas	Mongolia
Bahrain	Montserrat
Barbados	Morocco
Belize	Namibia
Bermuda	Nauru
Bolivia (Plurinational State of)	Netherlands Antilles
Bonaire/S.Eustatius/Saba	New Caledonia
Botswana	Nicaragua
Brazil	Nigeria
British Indian Ocean Territory	Niue
British Virgin Islands	Norfolk Island
Brunei Darussalam	Northern Mariana Islands
Cabo Verde	Occupied Palestinian Territory
Cameroon	Oman
Cayman Islands	Pakistan
Chile	Palau
China	Panama
China, Hong Kong SAR	Papua New Guinea
China, Macao SAR	Paraguay
Colombia	Peru
Congo	Philippines
Cook Islands	Pitcairn Islands
Costa Rica	Puerto Rico
Cuba	Qatar
Curaçao	Republic of Korea
Cyprus	Réunion
Côte d'Ivoire	Saint Barthélemy
Democratic People's Republic of Korea	Saint Helena, Ascension and Tristan da Cunha
Dominica	Saint Kitts and Nevis
Dominican Republic	Saint Lucia
Ecuador	Saint Pierre and Miquelon
Egypt	Saint Vincent and the Grenadines
El Salvador	Saint-Martin
Falkland Islands (Malvinas)	Samoa
	Saudi Arabia

#### Appendix 4 (Continued)

Fiji	Seychelles
French Guiana	Singapore
French Polynesia	Sint Maarten
French Southern and Antarctic Territories	Sri Lanka
Gabon	Suriname
Ghana	Swaziland
Greenland	Syrian Arab Republic
Grenada	Taiwan Province of China
Guadeloupe	Thailand
Guam	Tokelau
Guatemala	Tonga
Guyana	Trinidad and Tobago
Honduras	Tunisia
India	Turkey
Indonesia	Turks and Caicos Islands
Iran (Islamic Republic of)	United Arab Emirates
Iraq	United States Virgin Islands
Jamaica	Uruguay
Jordan	Venezuela (Bolivarian Republic of)
Kenya	Viet Nam
Kuwait	Wallis and Futuna Islands
Lebanon	Western Sahara
Libya	Zimbabwe
Malaysia	
Maldives	