Review of standard regulations on the processing of fishery products in Indonesia

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Abstract. Standards for processing fishery products are intended to provide quality assurance and safety for fishery products. The implementation of standards involves various parties, including the governments, business actors, and consumers. Regulation on the application of standards need to be issued so that it can provide optimal benefits in accordance with the objectives of the standard. This study aimed to review the regulations regarding the application of standards governing the implementation of a quality assurance system and food safety in fishery products. This study is a policy review on legal and documents related to processed fish products. The application of standards is to provide an understanding of the methods, to practices how to produce fishery products in accordance with the requirements and food safety concerns, as well as to meet the regulatory requirements. The standards for fishery processing products include regulations in several ministries which include SKP, PMMT/HACCP, Distribution License, Halal, and SNI. The standards are enforced by some institutions that have the potential for over-regulation and duplication. The regulations need to be simplified and integrated to hinder fishery business yet improving the business ecosystem. The Government stipulated the CK Law and its derivative regulations to simplify the regulations without ignoring the food safety requirements and ensuring a conducive business environment. After being fully implemented, the effectiveness of the CK Law needs to be reviewed for improving the implementation of regulations, particularly for fish and fishery products in the future.

1. Introduction

Indonesia is an archipelagic country consisting of approximately 17,504 islands. It has about 6.4 million km² of waters which includes 0.29 million km² of sea, 3.11 million km² of inland waters and archipelagic waters, and 3.00 million km² of Exclusive Economic Zone (EEZ) [1]. Coastal and marine bioresources that could be managed include fisheries, coral reefs, seagrass beds, mangrove, seaweed, and biotechnology products. The sustainable potential of Indonesian marine fishery resources is estimated at 12.54 million tons per year in Indonesian waters and EEZ waters [21]. The Permitted Total Catch is 10.03 million tons per year or about 80% of the sustainable potential, and only 6.98 million tons or 69.59% has been utilized [1]. In addition, the potential of the aquaculture area of 17.91 million hectares has just been utilized of around 2.7%. Meanwhile, other economic potentials have not been managed optimally. This includes the maritime industry, biotechnology, marine services, salt production and its derivatives, marine biopharmacology, and others.
The fisheries sector has contributed to the community's economy and the country's economy. Fishery sector contributes to GDP growth. The Ministry of Marine and Fisheries of Indonesia reported that in 2019, the contribution of the fisheries sector to GDP was around 5.73-7.89 percent. Fishery products are also a source of healthy food ingredients. Fishery products are considered to have better nutritional content than other foods. The consumption level of fishery products tends to increase, in which the consumption level in 2020 was 56.39 kg/capita/year, and projected to reach more than 60 kg/capita/year in 2024. Furthermore, the exports performance of Indonesian fishery products also tends to increase, both in volume and value. In 2019, Indonesia's exports of fishery products generated foreign exchange of USD 4,936 million or 1,184 thousand tons [2].

One of the characteristics of fishery products is perishable. The processing of fishery products that are not in accordance with hygiene and sanitation requirements can cause physical, chemical, and biological contamination that can cause poisoning or food safety issues. In order to produce safe fishery products for consumption, the government needs to make regulations on quality assurance and safety of fishery products. These regulations are technical requirements or standards that describe product specifications or procedures for processing fishery products safe to be consumed. In addition to ensuring the safety of fishery products consumed, regulations must also consider the capability of fishery products processor, especially micro and small business. The balance of interests between consumers and producers is very important to build a conducive business environment.

The fishery products involve many aspects concerning the authority of several government institutions in regulating according to their sector. In the aspect of developing the fishery sector, the regulation is carried out by the Ministry of Maritime Affairs and Fisheries (MMAF), the safety food products by the Food and Drug Monitoring Agency (BPOM), standardization by the National Standardization Agency (BSN), and the halalness of food products by the Halal Product Guarantee Agency (BPJPH). The application of many regulations has the potential to cause problems of regulatory duplication or over regulation. Excessive regulation also causes high cost economy and inefficient supply of resources, as well as low product competitiveness. The Indonesian government has ratified the Law No. 11 of 2020 (CK Law) which is expected to eliminate these impacts and still pay attention to the food safety aspects of fishery products.

This paper aimed to review the regulations regarding the application of standards governing the implementation of a quality assurance system and food safety in fishery products. The main discussion in this paper is to identify the regulations governing the quality assurance system and food safety in fishery products and to analyze the interrelationships between these regulations. This paper also identifies the potential obstacles and formulates recommendations to overcome these obstacles.

2. Research Method
This research was conducted by looking for legal documents i.e. the Fisheries Laws, the Foods Law, the Standardization and Conformity Assessment Law, the Halal Law, and the Job Creation Law, and their derivative regulations which included Government Regulation (PP), Ministry or Agency Regulation, as well as other relevant documents and references. This approach was used to review and analyze regulations related to the object of study, legislation related to regulation, and food safety standards in the processing of fishery products. Meanwhile, the analysis used was qualitative analysis by analyzing documents and providing descriptions of problem solving. The regulations that were reviewed and analyzed as shown in Table 1.
### Table 1. The regulations that were reviewed and analyzed

| Laws (UU) | Government Regulation (PP) | Ministerial or Agency Regulation |
|-----------|----------------------------|----------------------------------|
| • Undang-Undang Nomor 31 Tahun 2004 tentang Perikanan (Fisheries Law) | Peraturan Pemerintah Nomor 57 Tahun 2015 tentang Sistem Jaminan Mutu dan Keamanan Hasil Perikanan serta Peningkatan Nilai Tambah Produk Hasil Perikanan (Quality assurance system and fisheries product safety and value added improvement of fisheries products) | • Peraturan Menteri Kelautan dan Perikanan Nomor 58/Permen-KP/2016 Tentang Pemberlakuan SNI Tuna Dalam Kemasan Kaleng dan SNI Sarden dan Makerel dalam Kemasan Kaleng Secara Wajib (Mandatory SNI for tuna, sardine, and mackerel canned) |
| • Undang-Undang Nomor 45 Tahun 2009 tentang Perubahan Atas Undang-Undang Nomor 31 Tahun 2004 Tentang Perikanan (Revision of the Fisheries Law) | | • Peraturan Menteri Kelautan dan Perikanan No. 10 Tahun 2021 tentang Standar Kegiatan Usaha dan Produk pada Penyelenggaraan Perizinan Berusaha Berbasis Risiko Sektor Kelautan dan Perikanan (Standards for business and products in the implementation of risk-based licensing for the marine and fisheries sector) |
| Undang-Undang Nomor 18 Tahun 2012 tentang Pangan (Foods Law) | Peraturan Pemerintah Nomor 86 Tahun 2019 tentang Keamanan Pangan (Food safety) | • Peraturan Badan Pengawasan Obat dan Makanan Nomor 27 Tahun 2017 tentang Pendaftaran Pangan Olahan (Processed food registration) |
| | | • Peraturan Badan Pengawasan Obat dan Makanan Nomor 7 Tahun 2021 tentang Perubahan Atas Peraturan Badan Pengawasan Obat dan Makanan Nomor 27 Tahun 2017 tentang Pendaftaran Pangan Olahan (Revision of processed food registration) |
| Undang-Undang Nomor 20 Tahun 2014 tentang Standardisasi dan Penilaian Kesesuaian (Standardization and Conformity Assessment, SCA Law) | Peraturan Pemerintah Nomor 34 tahun 2018 tentang Sistem Standardisasi dan Penilaian Kesesuaian Nasional (National Standardization and Conformity Assessment System) | Peraturan Badan Standardisasi Nasional Nomor 7 Tahun 2020 tentang Tata Cara Pemberlakuan Standar Nasional Indonesia Secara Wajib (Procedure for Compulsory Enforcement of the SNI) |
| Undang-Undang Nomor 33 Tahun 2014 tentang Jaminan Produk Halal (Halal Law) | Peraturan Pemerintah Nomor 39 Tahun 2021 tentang Penyelenggaraan Bidang Jaminan Produk Halal (Halal product assurance) | |
| Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja (Job Creation, CK Law) | • Peraturan Pemerintah Nomor 5 Tahun 2021 tentang Penyelenggaraan Perizinan Berusaha Berbasis Risiko (Risk-based business licensing) | • Peraturan Pemerintah Nomor 7 Tahun 2021 tentang Kemudahan, Perlindungan dan Pemberdayaan Koperasi dan Usaha Mikro, Kecil, dan Menengah (facilitation protection, and empowerment to cooperatives and micro, small and medium enterprises) |
| | • Peraturan Pemerintah Nomor 5 Tahun 2021 tentang Penyelenggaraan Perizinan Berusaha Berbasis Risiko (Risk-based business licensing) | |
| | • Peraturan Pemerintah Nomor 7 Tahun 2021 tentang Kemudahan, Perlindungan dan Pemberdayaan Koperasi dan Usaha Mikro, Kecil, dan Menengah (facilitation protection, and empowerment to cooperatives and micro, small and medium enterprises) | |
3. Result and Discussion

3.1. Fishery Products Safety

Fishery products are important food ingredients which are also a source of protein, good fatty acids, vitamins, and minerals. They also have high levels of long-chain polyunsaturated fatty acids (Omega-3), including eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Although fishery products have a very good nutritional content, but it also can cause a high health risk. Fishery products are perishable, which is prone to decay or quality deterioration. Deterioration of fish quality can occur due to an autolysis mechanism or uncontrolled enzyme activity after the fish has died, damage caused by bacteriological activity, and oxidation reactions [3]. Bacteria will continue to grow which causes further damage and leads to a bad odor and changes in the meat texture.

In addition to the risk of spoilage, fishery products also have a risk of contamination caused by chemical residues from pesticides, heavy metal contamination, antibiotics, and dioxins. Sources of food safety risks occur in activities along the production chain. The dangers posed by fishery products in the production chain include biological, chemical, and physical hazards [4]. In this case, the risk of food safety of fishery products can cause disease in humans (fish-borne illness). Arisanti et al. [5] showed data on food poisoning outbreaks (foodborne outbreaks) in 2000 - 2015. The most common agent causing food poisoning outbreaks was pathogenic bacteria by 131 cases (74.9%) including E.coli by 35 cases (20%), Bacillus cereus by 34 cases (19.4%) and Staphylococcus sp by 34 cases (18.3%). In addition, chemical agents causing food poisoning were found in 31 cases (17.7%) including histamine by 12 cases (6.7%) and nitrite by 7 cases (4%).

The contamination of hazardous substances in food that exceeds the limit can cause poisoning and even death. WHO reported that approximately 70% of diarrhea cases in developing countries are caused by contaminated food, mostly from food in catering services and restaurants. In the United States, 20% of poisoning cases occur in restaurants and 3% in the food industry. In Europe, 46% of contamination sources come from homes, 15% of restaurants/hotels, 8% of banquets, 6% from health facilities and canteens, and 5% from schools. Meanwhile, the Food and Drug Monitoring Agency of Indonesia (BPOM) also conducted an inventory of poisoning events through online news in 2014 - 2015. The identification results showed that there were 186 incidents in 2014 and 153 incidents in 2015, with various causative factors, such as food ingredients, natural toxins, pesticides, and environmental pollution [6]. In addition, some cases of food poisoning are caused by the lack of compliance with regulations on the production and distribution of food products. In 2007, an inspection was carried out on 4,007 processing units. It was found that 2,271 units or 56.68% did not meet the provisions of Good Manufacturing Practices (GMP). Even in the home food industry, 75.91% of processing units do not meet the requirements of GMP [7]. The food safety risk of the fishery products must be managed through regulations that can ensure the food from the fishery products is safe for consumption.

3.2. Regulation on the Fishery Processing Products

The fishery products involve many aspects, including food safety and quality assurance, consumer convenience, job opportunities for people, and a good business environment. The regulation of fishery products is needed to ensure regularity to obtain optimal benefits in accordance with the objectives of fishery development. The development of fishery products is managed by several ministries/agencies in accordance with their sectors. This causes ministries/agencies to issue regulations on one product. The implication of the many regulations will have an impact on duplication and over-regulation of products.

3.2.1. The Fishery Laws

The main reference for regulation in the field of processing fishery products (Fisheries Laws) is Law No. 31 of 2004 [8] which is revised to Law No. 45 of 2009 [9]. The fishery business system includes pre-production, production, processing, and marketing. The objectives of fisheries management as regulated in the Fisheries Laws related to the safety of fishery products are to increase productivity, quality, added value, and competitiveness. This indicates that food quality and safety are important factors, in addition to the business actors who can run their businesses productively and competitively.
The governing of fishery processing products, apart from referring to the Fisheries Laws, also refer to Law No. 18 of 2012 (Foods Law) [10], Law No. 20 of 2014 (SCA Law) [11] and Law No. 33 of 2014 (Halal Law) [12], and its derivative regulations. The objectives of fishery management based on the Fisheries Laws are in line with the objectives of food administration based on the Food Law, namely providing food that is diverse and meets the requirements of safety, quality, and nutrition for public consumption; facilitate or increase access to food for the community, especially people in food and nutrition insecurity; increase added value and competitiveness of food commodities in domestic and foreign markets; increase public knowledge and awareness about safe, quality, and nutritious food for public consumption; and improve welfare for farmers, fishermen, fish farmer, and food business [10]. Based on the Fisheries Laws and the Food Law, quality assurance and safety of fishery products are an important factor in regulation in the field of food processing of fishery products.

In relation to quality assurance and safety of fishery products, Law No. 31 of 2004 Article 20 states that the processing of fish and fishery products must meet the requirements of fish processing feasibility, quality assurance system, and safety of fishery products [8]. Processing feasibility is a condition in meeting the basic principles of processing, which include construction, layout, sanitation, hygiene, selection of raw materials, and fish processing techniques. The application of the fish processing feasibility requirements is proven by the Certificate of Processing Feasibility (Sertifikat Kelayakan Pengolahan or SKP). The SKP is issued by the Ministry of Maritime Affairs and Fisheries. The provisions on SKP are regulated according to Government Decree (PP) No. 5 of 2021 [17] and the Regulation of the Minister of Marine Affairs and Fisheries No. 10 of 2021 [22]. Meanwhile, the evidence of the implementation of the fishery product quality assurance system is a Certificate of Program Manajemen Mutu Terpadu/Hazard Analysis and Critical Control Point (PMMT/HACCP). The PMMT/HACCP is a certificate given to fish processing industry who has complied with and implemented the quality assurance and safety system of fishery products at the fish processing unit. The PMMT/HACCP is issued by the Ministry of Marine Affairs and Fisheries. This certification is regulated in accordance with Regulation of Government No. 5 of 2021 [17] and the Regulation of the Minister of Marine Affairs and Fisheries No. 10 of 2021 [22]. Based on the Fisheries Laws, the fish processing unit must have the SKP and the PMMT/HACCP Certificates.

3.2.2. The Standardization and Conformity Assessment Law

The definition of standards according to the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) are:...document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context [27]. The legal basis for implementing the standardization and conformity assessment system in Indonesia refers to Law No. 20 of 2014 concerning Standardization and Conformity Assessment (SCA Law) [11]. The standardization process includes the process of planning, formulating, establishing, implementing, enforcing, maintaining, and supervising standards that are carried out in an orderly manner and in collaboration with all stakeholders. One of the important objectives of standardization is to increase protection for consumers, business actors, workers, and other communities, as well as the state, whether from the aspect of safety, security, health, as well as the preservation of environmental functions. The National Standardization Agency of Indonesia (BSN) establishes the Indonesian National Standard/Standar Nasional Indonesia (SNI).

SNI is basically voluntary, meaning that there is no compulsion in applying the SNI. In matters related to the interests of safety, security, health or the preservation of environmental functions, the Government has the authority to stipulate mandatory application of the SNI [11] [15]. The Head of BSN stipulates the BSN Regulation No. 7 of 2020 to regulate the Procedure for Compulsory Enforcement of the SNI [25].

In the case of fishery products, to guarantee the quality and safety of tuna products, sardines, and mackerel in cans, the Minister of Maritime Affairs and Fisheries has enforced mandatory SNI for them through the Regulation of Minister of Marine Affairs and Fisheries No. 58/Permen-KP/2016 concerning the Compulsory Enforcement of the SNI for Tuna in Cans and the SNI for Sardines and Mackerel in cans.

The National Standardization Agency (BSN) stipulates the BSN Regulation No. 7 of 2020 to regulate the Procedure for Compulsory Enforcement of the SNI.
Cans [20] [28]. The SNI certificate was issued by a Product Certification Body which was accredited by the National Accreditation Body of Indonesia (KAN or Komite Akreditasi Nasional) [11] [15].

3.2.3. The Food Law

Referring to the Foods Law, for the control of safety, quality, and nutrition, all processed food traded in retail and food business are required to have a distribution license (Izin Edar). Iizin Edar refers to the Regulation of Government No. 86 of 2019 [16] and its derivatives, namely Regulation of BPOM No. 7 of 2021 [24] and Regulation of the POM No. 27 of 2017 [23] through food product registration as 3 types of certificates, those are:

- SP-PIRT for home industries food products
- MD for domestically produced food products
- ML for imported food products

To get the SP-PIRT, business must apply to the local Health Office, while MD and ML apply to the BPOM. The consumers also need to obtain information about food products. In accordance with the Foods Law, packaged food products must be given a food label containing information related to origin, safety, quality, nutritional content, and other information.

3.2.4. The Halal Law

Furthermore, to protect Indonesian consumers, who are predominantly Moslem, the Government enacted Law No. 33 of 2014 concerning Guaranteed Halal Products (Halal Law) [12]. The Halal Law aims to provide comfort, security, safety, and certainty of the availability of halal products for the public in consuming and using products; and increase added value for business actors to produce and sell halal products. Products that enter, circulate, and are traded in the territory of Indonesia must be certified halal. Halal Product Assurance is carried out through a series of Halal Product Process (PPH) activities which include the provision of materials, processing, storage, packaging, distribution, sales, and product presentation.

The Halal Certificate is given to products that made from halal materials and meet the requirements of the halal product process which includes the supply of materials, processing, storage, packaging, distribution, sales, and service of the products. The regulation of halal certification refers to the Regulation of Government No. 39 of 2021 concerning the Implementation of the Halal Product Assurance [19]. The Halal Inspection Agency (LPH) conducts inspection and/or testing of halal product based on the standards set by the Halal Product Assurance Administration Agency (BPJPH). The inspection and/or testing of the halal product includes checking the validity of the document and checking and/or testing the halal properties of the product. The determination of product halal characteristics is carried out by MUI through the MUI Halal Fatwa Meeting (Indonesian Ulema Council).

3.3. Discussion

Based on laws previously mentioned, a fishery product must comply with several regulations issued by different government agencies. The processing of fishery products must meet technical/standard requirements that are multi-regulatory, including the Ministry of Maritime Affairs and Fisheries (KKP), the Food and Drug Monitoring Agency (BPOM), the National Standardization Agency (BSN), and the Halal Product Guarantee Agency (BPJPH). The application of several regulations in one type of business has the potential to cause problems of regulatory duplication or over regulation, and disharmony [32]. Excessive regulation also results in unnecessary costs and inefficient provision of resources. For processing fishery products, it can cause duplication and complexity in management document and record systems, a need for additional resources, a development of new departments to implement and maintain management systems, an inability to focus on the implemented standards, ineffective internal audits and management reviews, additional time needed for management system activities, increased man-days allocated to external audits and a higher cost of the certification process [31]. Excessive regulation does not support the creation and development of businesses and even tends to hinder businesses. To overcome this, Setiadi [32] and Chandranegara [29] suggested simplification of regulations to support ease of doing business. Besides simplification, it is also necessary to
reconceptualize the understanding of regulatory needs and create synergies between regulators [29]. Simplification must be supported by the highest state leadership and all stakeholders [32]. Considering that food safety requirements for the fishery products are very important, these requirements cannot be compromised. The application of SKP, PMMT/HACCP, Halal, Distribution License, and SNI standards must still be carried out to protect consumers and meet export requirements. The fishery products that are not safe for consumption can be harmful to human health, including diarrhea and vomiting and even death [30]. The food safety requirements are also the main requirements in the export of fishery products. Countries that import fishery products, such as the United States, have set very strict safety requirements for fishery products. The cases of refusal to import the fishery products are indicator of the tightness of these requirements [7]. Halal requirements on the fishery products are also important requirements for Indonesian people, who are predominantly Muslim. The fishery products that are sold must be guaranteed to be halal. The halal logo is one of the preferences of Indonesian consumers in choosing fish products [26].

To solve the over-regulation problem, it can be done by simplifying regulations without ignoring the food safety requirements and ensuring a conducive business environment. For this reason, the Indonesian government stipulates the CK Law and its derivative regulations, including PP No. 7 of 2021 regarding business facilitation for SMEs [18] and PP No. 5 of 2021 concerning risk-based approach in business permit [17]. The regulations are intended to provide convenience, protection, and empowerment of cooperatives and micro, small and medium enterprises, improvement of the investment ecosystem, and acceleration of national strategic projects, including increased protection and welfare of workers. In the context of the regulations on the fishery product processing businesses, simplification is carried out by simplifying risk-based business licensing and empowering micro and small businesses. Fishery product processing businesses that have low to medium risk are given relaxation of SKP obligations after 2 years of receiving business permits, registration of SP-IRT (distribution license for micro and small businesses), and right to use SNI Mark Under Supervision (Tanda SNI Bina UMK). For the obligation of Halal Certification, micro and small enterprises (UMK), the obligation to be certified halal is carried out with a self-declaration, and the cost of certification is borne by the Government (free). The map of the regulations of fishery processing product may be simplified as simple figures as follow (Figure 1).

**Figure 1.** The regulatory map on the fishery products processing

The CK Law and its derivative regulations have been still in the early stages of being implemented. The regulations should be monitored and evaluated periodically for their effectiveness whether they have met the intended purpose of enacting the regulations.
4. Conclusion and Recommendations

The application of standards has an impact on providing an understanding of the methods and practices of how to produce fishery products in accordance with the requirements, food safety concerns, and meet regulatory requirements.

Some standards that must be applied to the fishery product processing business include SKP, PMMT/HACCP, Distribution License, SNI, and Halal. The standards are enforced by some institutions that have the potential for over-regulation and duplication. The regulations of the standard need to be simplified and integrated so as not to hinder business but to improve the investment ecosystem. The standards of the fishery product cannot be compromised because they are related to consumer’s safety and import requirements. To simplify the regulations without ignoring the food safety requirements and ensuring a conducive business environment, the Indonesian government stipulated the CK Law and its derivative regulations regarding business facilitation especially for SMEs.

After the fully implementation of the CK Law, the effectiveness of the CK Law needs to be reviewed for improving the implementation of regulations in the future.

Acknowledgments

Authors wishing to acknowledge assistance or encouragement from colleagues in Directorate of Strengthening of Standards and Conformity Assessment Implementation of Badan Standardisasi Nasional, Dr. Zakiyah, and Dadang Jatmiko, PhD.

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