

Possibilities of Government's Intervention on Canned Fish Industry based on LCA Approach.

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Abstract

Nowadays, the competitiveness for industry is not only measured by the quality of product, but also its sustainability for the environment. Life cycle assessment (LCA) is tool for the systematic evaluation of the environmental aspects of a product or service system through all stages of its life cycle. In Indonesia, the application of LCA is quite narrow. Most of the researches and applications of LCA only involves the industry. Whereas government can plays a role in LCA applications. The aim of this study to identify the possibilities of government role on fish canning industries based on Life Cycle Assessment approach. A fish canning industry case is used in this study. In particular case used, the fish canning process is classified in 7 production subsystems. Reducing the environmental impact of fish canning industry could be undertaken by the industry itself and the government could support through rulemaking and regulations.

Keywords: *Fish canning industry, government's intervention, life cycle assessment*

1. INTRODUCTION

Environmental friendly products become trends in the last decade (Melece L, 2010, Mayrowani H, 2012; Viðarsson J R, 2008). These trends can be found in the growth of existing sustainable trade markets, relative to conventional markets, and in the opening of new markets for green goods and services (UNEP, 2013). Usually it is manifested in environmental certification (eco certification) or environmental label (ecolabel) on the products. Eco-certification or ecolabel is not a must for the industry but rather a voluntary initiative conducted by the company to establishing identity as an environmentally friendly product. Even if eco-certification of individual farms (seafood) implies that better and more responsible methods are practiced, this does not necessarily mean that the production system is sustainable, i.e., somewhat less unsustainable does not imply sustainable (Jonell et al, 2013)

There are two approaches to eco-certification and three basic types of ecolabel. These are the basic tools that can be used by policy makers to design effective

environmental information delivery systems. ecolabels can be used to communicate clear and credible information about both specific issues and comprehensive product and process related information. Eco-certification systems provide information on the general environmental management of a company (Rotherham, 1999)

Ecolabel is an optional for the company to declare their eco friendly product. It takes high cost to obtain certification which might be difficult to access for small and medium industries. As well, there is increasing domestic and international legal and regulatory pressures to produce eco friendly product in many ways such as reducing emissions (Winter S et al, 2009).

Life cycle assessment is an analytical tool to addresses a comprehensive set of environmental impacts throughout the production, distribution, use and disposal of a product. LCA is usually used in ecolabel type 1. In accordance with ISO 14040 standards, it has four steps to complete the assessment: goal and scope definition, inventory analysis, impact assessment, and interpretation. In Indonesia, life cycle assessment has been

widely employed for assessing or comparing environmental impacts of products and systems during their whole life cycle (Choiron et al, 2013; Rosmeika et al 2010; and Siregar et al, 2015). In strategic review, input and output approach from LCA can be used for devise regulation. Input stage for prevention and output stage for process evaluation.

There are four stakeholders related to fish canning industry in Indonesia: government through its related ministry or department, agency / association, producer/industry (Departemen Perindustrian, 2009) and consumer as end user of product. Each has the role and function of mutual support in sustainability activities. The aim of this study was to determine government regulations related fish canning industry using LCA approach.

2. Material and Methods

This study is a literature research with one fish canning industry in Banyuwangi Indonesia used as a sample to identify the process. Life cycle assessment is used to identify input and environmental impact of each stage (classified into 7 subsystems). Studies conducted on prevailing regulations in Indonesia related to inputs, outputs and impacts generated by fish canning industry.

3. Result and Discussion

Fish Canning Processes

Fish canning production stage start from procuring fresh fish (*Sardinella longiceps* sp.) from local fishermen or frozen fish from other countries as a raw material. There are three main energy sources: fuel, electricity, and wood also 2 major wastes those are water waste from washing stage, and emission from fuel and wood burning. The highest energy consumptions are electricity for canning machine and wood for combustion in boiler. The highest greenhouse gas emission released in canning and sterilizing stage.

In Figure 1, fish canning process stages (thick line) are classified into 7 subsystems. The thick dotted line shows that frozen fish as a raw material imported from other country has different stage compare with fresh fish. Imported fish directly process into subsystem 2 and the consequences of this process flow are different amount of input or output calculated. The thin arrows with alphabet shows input and output for fish canning industry based on LCA. Both input and output shows in Fig. 1 have to be identified and evaluated in order to get more ecofriendly product.

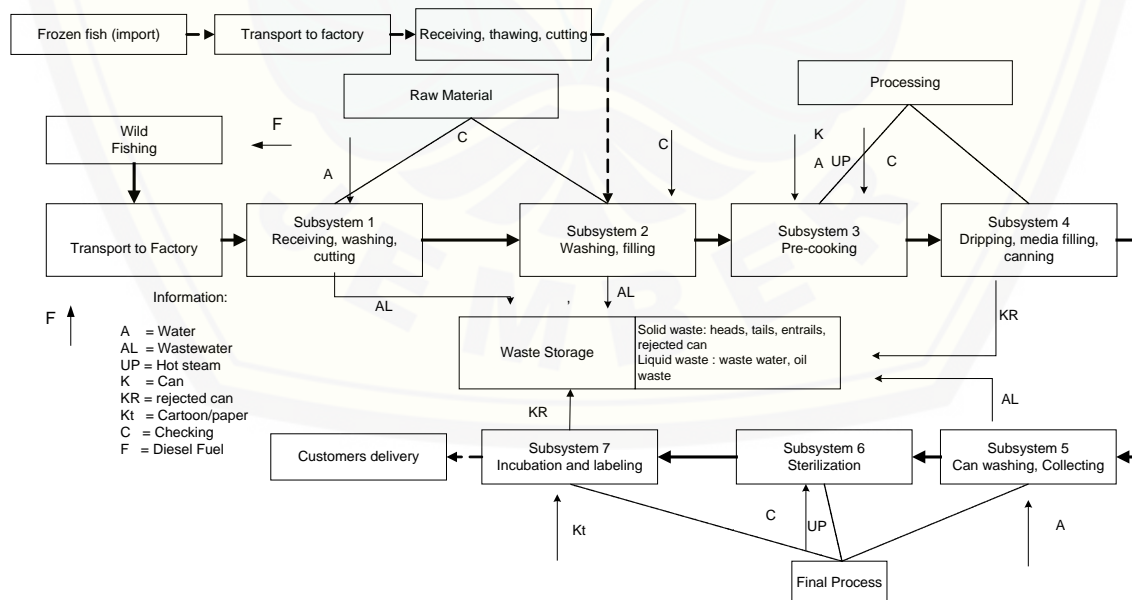


Figure 1 Fish Canning Process

Stakeholders Associated With Fish Canning Industry in Indonesia

In Indonesia, the ecolabel certification carried by the private sector that has been accredited by KAN. It takes awareness and voluntary contributions from industries to generate eco friendly products. Product certification requires a high cost. Those make community-based small and medium industries might difficult to assess.

Ecolabel certification scheme in Indonesia is different from other countries, for example

in Japan; it is not required field verification. Committee assesses the documents submitted by the applicant, as well as the accreditation of testing laboratories is not the primary focus. The key of certification is honesty and trust the provided data. Abusing of the logo usage could make the company had to recall the products in the market and pay fines and may cause a company's reputation down, even cause the company has ceased to operate (Asdep Standarisasi dan Teknologi Bersih, 2006).

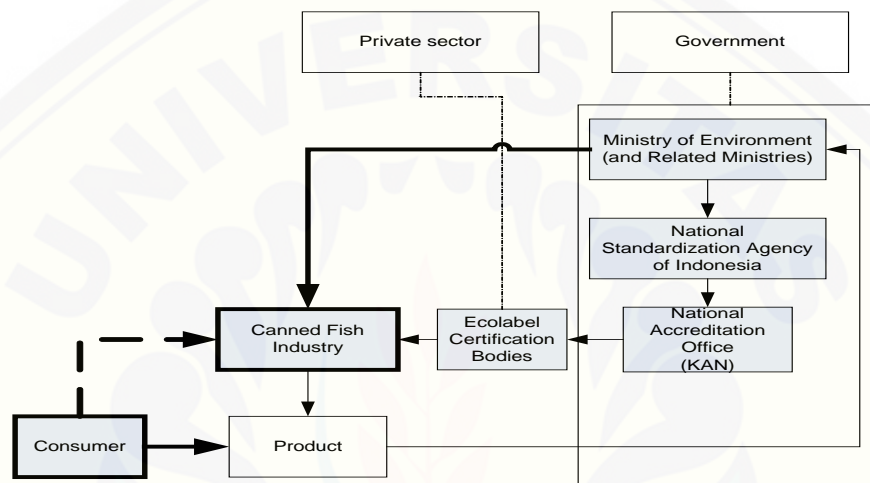


Figure 2 Stakeholders associated with fish canning industry in Indonesia

In Indonesia, there are six stakeholders associated with fish canning industry included the consumer. The roles of each stakeholders (shaded boxes) show in figure 2 are: Ministry of Environment formulates the implementation of ecolabel in Indonesia, National Standardization Agency of Indonesia validates the criteria (standard) of ecolabel, National Accreditation Office accredits the ecolabel certification bodies (LSE), and LSE evaluate and issue ecolabel certificates.

Figure 2 shows the role of government on ecoproduct through regulations and standards used in the certification process that implemented by ministries, BSN and LSE (square line). Government could directly

intervene through rule and regulation issued by related ministry and it can be firmly control the operation of industries (thick arrow from ministry box to canned fish industry). Consumer also can push the industry to produce more ecofriendly products by their demand. Fish canning industries have to fit their product based on consumer demand to compete in marketplace (thick dotted line).

Regulation in Indonesia

Regulations in Indonesia are interrelated and complementary between ministries. Energy consumption and emissions released used as a factors in life cycle assessment approach.

Table 1 Government’s regulation related with fish canning industry in Indonesia

Activity / Life Cycle Stage	Possible impacts	Regulation in Indonesia
Raw Material (wild fishing)	-Fuel consumption -Gas Emission	PERMEN ESDM No.06 dan 34 Tahun 2014 Local regulations (Bali and East Java)
Raw material (Import fish)	-Energy -Gas Emission	PMK No.132/PMK.010/ 2015 PERMENLH PER.12/MEN/2011
Transportation to fish production line	-Fuel consumption -Gas Emission	UU No. 32 Tahun 2009 PERMENLH No 16 Tahun 2012
Sub system 1 and 2 (receiving, washing, cutting)	-Water resource -Water Waste	PERMEN ESDM No.15 Tahun 2012 PERGUB JATIM NO 72 Tahun 2013 PERMENLH No 06 Tahun 2007
Sub system 3 to 5 and 7	-Electricity	PERMEN ESDM No.31 Tahun 2014 with tariff adjustment monthly
Sub system 6 (Sterilization)	-Wood -Emission	PERMENHUT No : P. 30/Menhut-II/2012 ,certificate of origin PP No.41 Tahun 1999 PERMENLH No.7 Tahun 2007
Canned fish product		SNI 19-7188.4-2006 PERMEN No 2 Tahun 2014

Refers to several existing regulations, Ministry of Environmental and Ministry of Energy and Mineral Resources has important role for achieving the ecofriendly canned fish product. There are some of the opportunities for the integration of LCA in Indonesian public policy. Several areas of policy were a) Quality of fuel for industries. Increase the quality of fuel especially by reducing sulfur levels in diesel strategically and consistently. b) Support for renewable energy. c) Implement CO₂ emissions labeling in diesel engines used by fishermen because all vessel size able to use subsidized low quality diesel fuel. d) Incentives for industry capable of implementing environmental quality standards, and e) integrate environmental standards into product standards (SNI)

CONCLUSSIONS

To support environment friendly product, government should increase interventions to industry through binding regulations. Delegation of authority to the private sector to evaluate and issue ecolabel certification does not mean that can reduce or eliminate the roles and functions of government to control the environment

Life-cycle approach is still not completely used in preparation of regulations in Indonesia. The government can use the cradle to grave approach on the fish processing industry to issue a comprehensive policy involving related

ministries. Another results and approach might be different if performed in other countries that have different rules and policies with Indonesia

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