Implementation of Pesticides Reductant Law for Healthy and Food Safety in the Indonesian Agriculture

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ABSTRACT: Law enforcement has always been problematic in Indonesia, including food safety and consumer health regulations. However, the Government of Indonesia has issued several rules on food safety, such as Law 18/2012 concerning Food and Government Regulation Number 28 of 2004 concerning Food Safety, Quality, and Nutrition. In reality, there are still many food producers who ignore food safety. The causes of food unsafety are the massive use of pesticides from farmers causes unhealthy food, reduced soil health, death of pest predators, and ecosystem imbalance. Who should anticipate these problems with a new legal breakthrough that can guarantee food safety by implementing the Pesticides Reductant Law? The Reductant is a breakthrough solution to reduce the dose of pesticide, and its effectiveness is the same as the application of a single amount of pesticide. Furthermore, the Reductant could reduce up to a half dose of the pesticide used and reduce the cost of using pesticides so that farmers will benefit more. This study will empirically analyze the advantages and disadvantages of the Pesticides Reductant Law is implemented in Indonesia. In addition, this study will provide conclusions in the form of the driving and inhibiting factors for the realization of Pesticides Reductant Law in Indonesia.

KEYWORDS: Law Reductant Pesticides, Consumer Protection, Food Safety.

I. INTRODUCTION

Pesticides are chemical substances that are mainly used in agricultural land or public health protection programs to protect plants from pests (destructive insects), weeds, diseases, and humans from vector-borne diseases (insects), such as cockroach could be a Food-borne disease vector (Stamati *et al.,* 2016; Donkor, 2020). However, there is a lot of evidence that the use of some pesticides causes long-terms severe negative effects on human health and the environment. More than 17.000.000 deaths have been reported to occur as a result of pesticide poisoning from 1960-2019 (Karunarathne *et al.*, 2019). Therefore, we must address these issues immediately to maintain consumer health and food safety. Food safety has been a global issue in recent years, and one of the most critical food safety issues in Indonesia is pesticide poisoning (Joko *et al.*,2020). Food safety is an aspect of human rights. This fundamental human right is guaranteed in Article 27, paragraph 2 of the 1945 Constitution, which states that every citizen has the right to life, liberty, and security. The state has the right to a decent living as a human being, including a food safety guarantee.

Unfortunately, the issue has not been paid much attention to in its application, including maintaining food safety from the hazardous pesticides that cause poisoning. Pesticides frequently poison farmers due to their propensity of utilizing excessive amounts and mixing harmful ingredient (Tri Joko, 2017). As a result, the pesticide reductant law must be implemented to reduce the danger of pesticide exposure to farmers while also ensuring food safety. The Reductant is a ground-breaking solution for reducing pesticide doses while maintaining the same level of effectiveness as a single dose. The lack of laws regulating the law's implementation has resulted in this breakthrough. This study will empirically analyze the advantages and disadvantages of the Pesticides Reductant Law is implemented in Indonesia. In addition, this study will provide conclusions in the form of the driving and inhibiting factors for the realization of law reductant pesticides in Indonesia. Hence, the novelties of this study are expected to provide input and consideration for policymakers, especially members Council, in revising the Food and Health Law in Indonesia.

II. STRATEGY IN IMPLEMENTING PESTICIDES REDUCTANT LAW

Indonesia adheres to multiple agency systems in organizing food safety supervision. According to APEC (2017), managing overview implementation of the numerous agency systems of food safety supervision and compilation of provisions in the Food and Health Law and their implementing regulation can be seen in the following table.

Food	Regulator	Supervisor
Fresh food from animals, plants and fisheries.	The Ministry of Agriculture and the Ministry of Maritime Affairs and Fisheries	District/city government
Processed food industry	The National Agency for Drug and Food Control (BPOM)	The National Agency for Drug and Food Control (BPOM)
Food processing and ready-to-eat food are produced in the home industry	The Ministry of Health	The Ministry of Health

Table 1. *Food Product Supervision Institutions in Indonesia*

Regarding the implementation of food safety, food products are divided into three types, as shown in the table above. This has a weakness when it is associated with efforts to prevent and handle cases of unsafe food distribution. With the condition of the multiple agent systems, this seems inefficient because it involves a bureaucratic path that is not short in each of the related institutions. Especially if there is no collaboration and coordination between food supervisory agencies due to any sector ego, therefore, it is necessary to consider a *single authority model* such as in the United States, namely the US Food and Drug Administration (USFDA), or in China, namely the China FDA, as a reference for a food control

system model that also pays attention to the social, cultural, and geographical conditions of Indonesia.

The two institutions in the two countries are devoted to regulating licensing, production, and supervision related to drug and food circulation in the community. Food safety is a significant condition in life, both for food producers and consumers. Producers must be responsive and aware that public awareness as consumers is currently getting higher and thus demands greater attention. To facilitate the implementation of food safety, the government and policymakers need to provide clear and firm laws to protect food consumers, including the regulations for maintaining the safety of pesticides by implementing the Pesticides Reductant Law. The steps suggested to policymakers or the government for implementing the Pesticides Reductant Law are as follows.

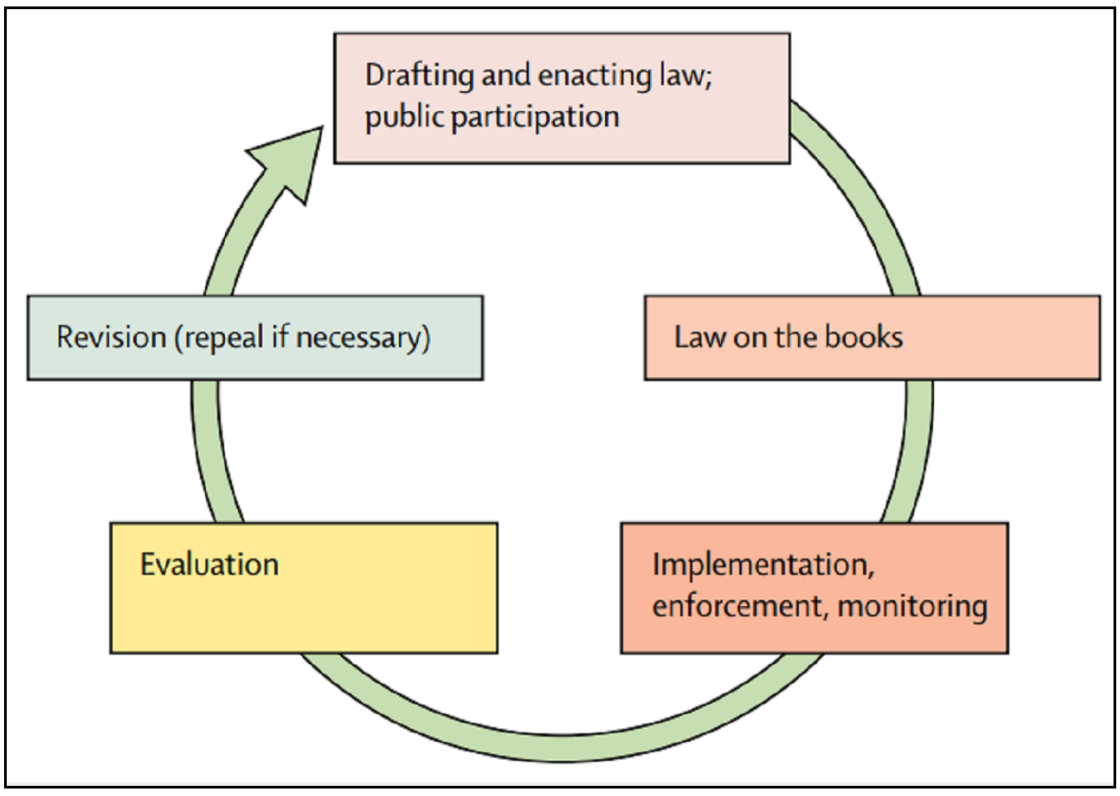

Figure 1. *Implementation of The Reductant Pesticide Law*

First, Drafting and enacting law. Formulating and enforcing The Reductant Pesticide Law must involve public participation. This is because the phenomenon became the reference for drafting this law based on unrest in the community. In addition, in formulating this policy, policymakers should look at examples of people who have applied pesticide reductants to strengthen it like a law is made. One example that has spread and produced this pesticide reductant is PT. Pandawa Agri Indonesia located in Banyuwangi. The advantages of this reductant can save the use of pesticides by up to 50% and reduce pesticide residues because they are made from environmentally friendly raw materials. *Second,* the law on the books. The Pesticides Reductant Law must be recorded to strengthen the quality of the law in writing and recognized by the state so that every citizen is obliged to follow it, especially food producers, to maintain food safety and reduce the risk of exposure to the harmful effects of the substances contained therein, such as pesticide residues. Thus, food safety and consumer health will be achieved. *Third,* implementation, enforcement, and monitoring.

Implementation is a concrete step in seeking the Pesticide Reductant Law to be enforced to achieve the common good for the society and maintain the safety of the food they consume. The law's implementation can be realized if law enforcement is carried out and accompanied by strict sanctions for those who violate it. Harsh sanctions are carried out so that every community does not underestimate the law's implementation, especially regarding the dangers of pesticide exposure to food and farmers. To assess the level of effectiveness of the implementation of this law, monitoring must be carried out by the authorities.

Fourth, evaluation. The evaluation is carried out to identify the difficulties or obstacles encountered in implementing The Reductant Pesticide Law so that the assessment can assist in resolving the problems and challenges faced. Furthermore, this evaluation is used to determine the effectiveness and efficiency of the methods or methods that have been used so that if there are any deviations from the plan, they can be addressed immediately.

Fifth, revision. Revisions are carried out if the policies that have been implemented are deemed less effective in terms of implementation, social

benefits, and other factors. This policy reference can be continued or discontinued depending on the level of help from the implemented program.

III. THE ADVANTAGE OF IMPLEMENTING THE PESTICIDE REDUCTANT LAW ON FOOD SAFETY

Regulation is a type of government intervention in society to manage it. The goal of regulation is to reduce fraud, misrepresentation, and unfair practices (Cranston, 1982). The idea that government intervention through regulation can solve societal problems is supported by Public Interest Theory. Regulations are intended to keep prices under control, to enforce safety standards, and to prevent accidents (Shleifer, 2005). Law is more than just a set of rules; it is a system that performs a variety of functions, such as constructing a society in which institutions govern actions (Hart, 2012). The goal of the law in the context of food safety is to protect people from hazardous behavior (Solaiman and Abu, 2014). Food safety is a condition and effort to prevent food from possible biological, chemical, and other substances that can interfere, harm, and endanger public health so that it is safe for consumption. According to (Pirsaheb *et al*., 2015), one of the materials that can cause food contamination is pesticides. The level of contamination in food due to exposure to pesticides is influenced by low and high doses. Therefore, the implementation of the Pesticide Reductant Law is an effort to minimize the risk of contamination in food and can achieve food safety for the community.

Pesticide reductant raw materials must be environmentally friendly in order to reduce pesticide residue in food. PT. Pandawa Agri Indonesia is an example of a company that has implemented and manufactured pesticide reductants in Indonesia. *Weed Solut-ion* is the pesticide reductant product manufactured by PT. Pandawa Agri Indonesia. The advantage of using this product is that it can reduce pesticide use by up to 50%. Based on these facts, pesticide reductants are one of the few breakthroughs that are both economically profitable for agricultural producers and safe for the community. In other hand, Many pesticides have been linked to health and

environmental issues (Zheng *et al.*,2016), and the agricultural use of certain pesticides has been discontinued (Alewu and Nosiri, 2011). Pesticides can be absorbed through the skin, ingested, or inhaled. The type of pesticide, the duration and route of exposure, and the individual's health status (e.g., nutritional deficiencies and healthy/damaged skin) all play a role in the potential health outcome. Pesticides in the human or animal body can be metabolized, excreted, stored, or bioaccumulated in body fat (Persihab *et al.*,2015). Chemical pesticides have been linked to a slew of negative health effects.

Based on some of the problems above, the implementation of the pesticide reductant law will be able to reduce the risk of various negative effects caused by pesticides in the long term. The use of pesticide reductants, which have been shown to save up to 50% of pesticides, will undoubtedly reduce the negative effects, particularly in terms of farmers' and consumers' health. Therefore, the implementation of this law is a real effort that can protect farmers' and consumers' health. According to UC Sustainable Agriculture Research and Education Program (2021), sustainable agriculture is farming in ways that meet society's current food and textile needs without jeopardizing current or future generations' ability to meet their own needs. The pesticides reductant law is expected to accelerate the realization of sustainable agriculture that reduces the massive use of chemical pesticides. Sustainable agriculture is a principle that agricultural producers must follow in order to achieve food safety with very low levels of pesticide residues. As a result, the implementation of this law is one of the best efforts toward sustainable agriculture that also values ecological principles.

Thus, how about the challenges and obstacles of implementing the pesticide reduction law? *First*, the high cost of policymaking. The implementation of the law requires various considerations that are reviewed from multiple angles, ranging from social advantages and disadvantages, as well as fees that are not small. This is because policymaking needs to coordinate with various parties, bring in experts, and various other factors that the need for policymaking costs is one of the obstacles to realizing pesticide reductant law. Therefore, the government and policymakers must

carefully and precisely prepare to realize the pesticide reduction law. *Second*, purchasing power. The implementation of the pesticide reductant law causes various challenges, including people's purchasing power of pesticides. If the pesticide reductant law is implemented, people's purchasing power for pesticides in companies or shops will gradually decrease.

This will undoubtedly reduce the opinion of pesticide companies in Indonesia. Pesticide companies will undoubtedly try to increase people's purchasing power of pesticides because most pesticide companies are profit-oriented without thinking about adverse effects on the environment. One of the things that might happen is that they will do a product demo for their consumers that the products they produce are safe for the environment. If farmers are not equipped with adequate food safety knowledge, they will likely continue to use chemical pesticides without mixing them with environmental-friendly materials such as pesticide reductants.

Third, Lack of Awareness and Knowledge of Farmers. Farmers in Indonesia tend to accentuate the profit without considering the danger towards the consumers. The lack of knowledge of the farmer can also become the reason why pesticides poisoning cases occur. According to (Oktaviani and Eram 2020), research conducted in the city of Semarang discovered that pesticides had poisoned 75% of farmers. The problem was thought to be due to farmers level of concern for food safety and their knowledge of hazardous materials such as pesticides that they commonly used. Farmers' lack of knowledge prevents them from finding solutions to make pesticides safer for food and the environment, such as mixing them with pesticide reductants like those used by PT. Agro Pandawa Indonesia. When the level of awareness and compliance with the pesticide reductant law is low, this situation will undoubtedly challenge enforcing the pesticide reductant law.

IV. CONCLUSION

Food security is a fundamental human right that every Indonesian citizen must obtain. The pesticide reductant law is the most recent effort to ensure food safety, reduce agricultural production costs, protect farmers' and consumers' health, and maintain the ecological balance in the farming environment. To achieve agricultural sovereignty in Indonesia, implementing the pesticide reductant law necessitates several collaborative efforts from policymakers and the community. Who must consider various challenges and obstacles in implementing this law for policymaking to be appropriately and quickly overcome.

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