LOCAL GOVERNMENT CAPACITY IN IMPLEMENTING SINGLE-USE PLASTIC BAN POLICY IN BALI PROVINCE

Ida Bagus Perdana Kumara,
Faculty of Social and Political Sciences,
Airlangga University, Surabaya,
ida.bagus.perdana-2020@fisip.unair.ac.id

Eko Supeno.
Faculty of Social and Political Sciences,
Airlangga University, Surabaya,
eko.supeno@fisip.unair.ac.id;

Bintoro Wardiyanto,
Faculty of Social and Political Sciences,
Airlangga University, Surabaya,
bintoro.wardiyanto@fisip.unair.ac.id;

ABSTRACT

Inorganic waste, especially single-use plastic, has a negative impact on the environment and society. The trend of increasing plastic production is not followed by the ability to manage waste properly. As a result, there is a buildup of waste in the world. Indonesia is one of the countries with the highest plastic waste problem. The problem of plastic waste can harm a country such as decline in the tourism sector. Bali Province is one of the provinces with tourism potential. Plastic waste is also a problem there. Several international media such as Time and BBC have reported about this situation. In response to this problem, the local government published *Peraturan Gubernur Bali Nomor 97 Tahun 2018* which prohibits the use of three types of single-use plastic, namely plastic bags, styrofoam, and straws. In its implementation, there is problem in public compliance, can find people use single plastic easily. This research contributes the analysis of local government capacity in implementing the policy. As a result, local governments are lacking in monitoring and sanctioning, causing a decrease in community compliance. However, they are strong enough in explaining the concept and causality relationship to achieve the goal.

Keywords: *Local Government Capacity, Policy Implementation, Single Use Plastic Ban, Bali Province*

A. INTRODUCTION

Inorganic waste is waste that can cause a decrease in environmental quality, one of which is plastic waste. Plastic pollution poses a threat to aquatic life, ecosystems and human health. According to the United Nation Environment Program (UNEP), since plastic was first introduced in the 1950s, there have been 8.3 billion tons of plastic and about 60 percent of that amount ends up in disposal

sites (TPA) and environment. The amount of plastic waste continues to grow and it is predicted that with the existing trend, by 2050 there will be more plastic waste in the oceans than the number of fish (United Nation Environment Programme, 2018). The large amount of plastic waste is caused by plastic production which is also increasing every year (Figure 1). It was recorded that in 2015 the world's plastic production reached 381 million tons (Ritchie & Roser, 2018). The increase in plastic production is the answer to public demand because of the nature of plastic which is durable, light, strong, and cheap.

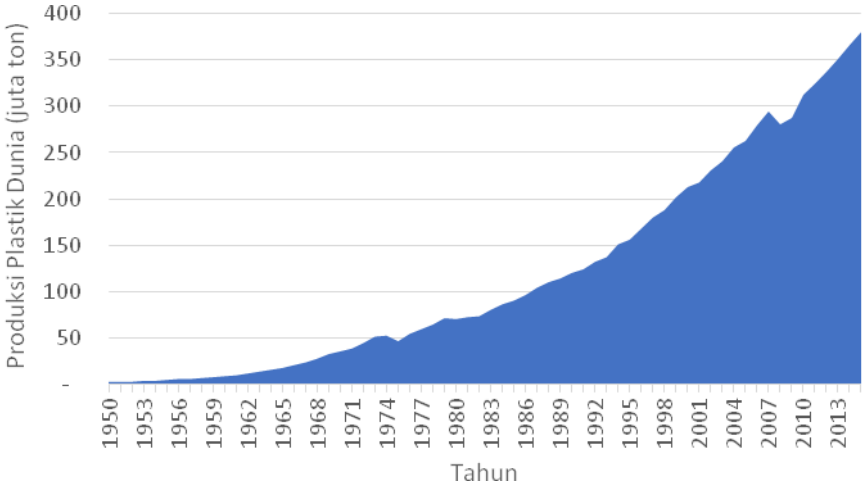


Figure 1. World Plastic Production 1950-2015
Source: Our World in Data, 2021

Plastic waste data today is still limited, the latest data is produced by researchers in the Netherlands. The data they collect is from 2019 and published in 2021. One of the results of their research is statistical data for the 20 countries with the most plastic emissions into the oceans. Indonesia is included in the list. Furthermore, Indonesia ranks highest in the number of rivers that contribute to plastic waste in the oceans, which are 5,540 rivers. In addition, Indonesia also occupies the third highest position in the ratio of plastic waste that is not properly managed and becomes waste in the ocean, which is 6.8 percent (Meijer, van Emmerik, van der Ent, Schmidt, & Lebreton, 2021). Plastic waste that is not managed properly is plastic waste that is disposed of carelessly, not managed properly (e.g. open burning of plastic waste), and is in landfills but the amount is not controlled. The waste can eventually enter the ocean via inland waterways, wastewater flows, and transport by wind or tides. Most of the plastic pollution in Indonesia is generated in Indonesia, more than 95 percent of plastic pollution comes from waste generated in Indonesia (World Economic Forum, 2020).

Based on data from the National Waste Management Information System, every year Indonesia produces as much as 33 million tons of waste generation. However, as many as 40.59 percent of the waste generated was not managed. Households are the largest source of waste, followed by Offices and Traditional Markets. Then the most common types of waste are Food Waste, Plastic, and

Wood/Twigs/Leaves. Plastic waste is the most inorganic waste produced in Indonesia, which is around 17.1 percent of the total waste (SIPSN, 2020). The large amount of plastic waste can damage the economic order through the decline in the quality of nature which then reduces the tourism sector market. Plastic waste also causes severe economic losses through damage to boats and fishing gear, negative effects on the tourism industry, and increased costs and efforts to clean up coastlines.(McIlgorm, Campbell, & Rule, 2011).

Table1. World Plastic Waste Statistics 2019

No.	Country	Plastic Waste in the Ocean	Mismanaged Plastic Waste (MPW)	MPW to ocean ratio	Number of Rivers Polluting the Ocean
A	B	C*	D*	E	F
1	Global	1.0 x 106	6.8 x 107	1.5%	31 904
2	Philippines	3.6 x 105	4.0 x 106	8.9%	4 820
3	India	1.3 x 105	1.3 x 107	1.0%	1 169
4	Malaysia	7.3 x 104	8.1 x 105	9.0%	1 070
5	China	7.1 x 104	1.2 x 107	0.6%	1 309
6	Indonesia	5.6 x 104	8.2 x 105	6.8%	5 540

*Column units C and D are in tons
Sources: Meijer, van Emmerik, van der Ent, Schmidt, & Lebreton, 2021

Bali Province is one of the provinces that relies on the tourism sector. The superiority of tourism in Bali has also been proven through its ability to contribute most of the GDRP and foreign exchange as well as absorb the workforce. The Covid-19 pandemic has increasingly shown that the province of Bali is highly dependent on the tourism sector. Since the travel ban, human mobilization is a core part of the tourism sector, the Province of Bali has experienced a deep social and economic decline.

As a common problem faced by many developing countries, waste management in Bali Province has not found the right scheme. For areas with a tourism core, waste is something that can degrade the advantages of tourism. Furthermore, it can have an impact on a decrease in the number of tourists followed by economic and social problems. Beaches which are one of Bali's main destinations, such as Kuta and Sanur beaches, are a place for plastic waste to flow. This is due to the fact that the river flowing to the coast in Bali carries waste from household, industrial, and socio-economic waste (Purnaya & Semara, 2018). During the rainy season, the level of accumulation of plastic waste on the beaches such as the Kuta, Seminyak, and Jimbaran areas has increased significantly up to 60 tons per day (Tribunnews.com, 2021). The problem of plastic waste that damages the environment in general is the result of human behavior (Godfrey, 2019). Thus, solving this problem must involve many stakeholders.

The problem of waste is not a new thing in Bali. Marshall (2011) for Time magazine criticized by mentioning that Bali is a vacation place like a hell. The analogy is taken because of the problem of waste, industrial waste, and traffic

jams (Marshall, 2011). The criticism received a response from the Bali Provincial Government which stated that the conclusions of the article were mostly drawn from personal opinion and without a comprehensive analysis (Detik.com, 2011). Furthermore, in 2018 the Province of Bali was again faced with the news of plastic waste. The Guardian and the BBC reported on the condition of plastic waste recorded by British divers in Nusa Penida. In his publication, the problem of plastic waste in Bali Province is caused by several factors such as ocean currents across Indonesia and shipments from Java (BBC.com, 2018), poor government planning, and low levels of awareness about waste and recycling (Lamb, 2018). Furthermore, Bali is also faced with the problem of almost full landfills (Radarbali.id, 2021).

(a) (b) (c)

Figure 2. Single-use Plastics according to *Peraturan Gubernur Bali Nomor 97 Tahun 2019* (a) plastic bags; (b) styrofoam; (c) plastic straws

As an effort to solve the plastic waste problem, the local government issued *Peraturan Gubernur Bali Nomor 97 Tahun 2018* concerning on ban Single-use Plastic Waste which was effective when the regulation was promulgated on 28 December 2018. Single-use plastic is defined as all forms of tools/materials made of or containing plastic, synthetic latex or polyethylene, thermoplastic synthetic polymeric materials and intended for single use. In this regulation there are three plastic processed materials that are prohibited from using, namely plastic bags, styrofoam (polysterina), and plastic straws (Figure 2). Furthermore, the three types of plastic decompose in a long time. Plastic bags around 20 years, styrofoam around 50 years, and plastic straws around 200 years (World Economic Forum, 2018; WWF Australia, 2021).

Furthermore, this regulation regulates the restrictions on the generation of single-use plastic waste which includes volume (weight), distribution, and use. To fulfill this purpose, this regulation regulates manufacturers, distributors, suppliers, as well as business actors and providers of single-use plastics to provide single-use plastic replacement products. In addition, manufacturers, distributors, suppliers, as well as business actors and providers of single-use plastics are prohibited from producing, distributing, supplying, and providing single-use plastics. Furthermore, the community in this regulation has an active role in preventing the use of single-use plastics in their daily activities. There are 15 action plans in this Governor Regulation starting from the identification and data collection of single-use plastic products, campaigns, public dialogue, education and scientific activities, activities prohibiting the use of single-use plastics, to law enforcement. The issuance of this regulation is highly appreciated. This regulation regarding the ban on the use of single-use plastic is not the first to be implemented

in Indonesia. Similar regulation has been implemented in Banjarmasin Province in 2016 which prohibits the use of plastic bags by modern retailers. In addition, the City of Bandung implemented a ban on the use of styrofoam in 2016. Then, a similar ban was carried out by the Surabaya City in 2019 and the DKI Jakarta in 2020. *Peraturan Gubernur Bali Nomor 97 Tahun 2018* has a wider scope than the regulation existing ones, such as in Banjarmasin and Bandung, which includes more types of single-use plastic and the parties involved in this regulation, Banjarmasin only prohibits modern retailers from providing plastic bags. At the national level, there are no regulations that prohibit the use of single-use plastics. Meanwhile, at the international level, several countries have imposed a ban on the use of single-use plastic.

After the implementation of the regulation, the consumption of single-use plastic has decreased, but it is only temporary. In 2021 the number of plastic bag consumption in Bali increased, especially in traditional markets. Behuria (2021) in his research in East Africa found that there were variations in the implementation of plastic prohibition regulations, there are countries that apply consistently and strictly, but some delay or choose to relax the ban. This relates to the main objectives of government. Countries with a focus on economic development through services such as tourism choose to apply the prohibition strictly, but countries with a low level of dependence on services or have other sources of economic resources delay or relax. With this fact, it can be seen that the Province of Bali does not show the same trend, implementing the regulations on the prohibition of single-use plastics strictly, even though it has a large dependence on the tourism service sector.

In addition, the Covid-19 pandemic has led to an increase in the use of single-use plastics. The increase in plastic consumption in several countries is a response to easing taken by the government as a step to improve hygiene and prevent the spread of Covid-19, such as in several states in the United States, United Kingdom, and South Australia. However, some countries in Africa such as Kenya, Rwanda, and Uganda still enforce strict bans on single-use plastics. It is also feared that the increase in plastic consumption during Covid-19 could become a new habit that is contrary to the goals of long-term environmental policies(Vanapalli, et al., 2021). The Bali Provincial Government did not relax the regulation on the ban on single-use plastic during the Covid-19 pandemic, which means the regulation remains in effect as it was when it was first promulgated. The increase in the use of single-use plastics occurred in several districts/cities in Bali Province (Table 2).

In its application there are still people who do not follow the regulation. People still cannot change old habits and tend to just want to be practical, by using single-use plastic (Murniati, 2020). Sellers get a tougher position, because some sellers admit that buyers do not want to buy their merchandise if they are not given a plastic bag. According to Hoffman's (2016) research, sellers with lower levels of compliance in implementing a ban on the use of single-use plastic bags come from grocery stores, supermarkets, and small shops. Then, according to Sharp et al. (2010) the largest suppliers of plastic bags are from grocery stores as

much as 70 percent, non-food retailers as much as 12 percent, and large retail stores as much as 8 percent.

Based on the previous explanation, it is known that the problem of plastic waste is facing the world, including Indonesia. The problem of waste can endanger the tourism industry, one area that is very dependent on the tourism sector is the Province of Bali. The problem of plastic waste also occurs in Bali, to overcome it, the local government issued *Peraturan Gubernur Bali Nomor 97 Tahun 2018* which aims to reduce waste generation through a ban on the use of single-use plastics. In general, the regulation is a fairly complete policy in controlling single-use plastic. The advantages of this policy are that it covers more types of single-use plastics than similar regulations that have been applied in Indonesia and the number of stakeholders involved is quite wide. In its implementation, the desired goal is only temporary, then the amount of consumption and plastic waste tends to increase. For this reason, this study will conduct an analysis of the implementation of *Peraturan Gubernur Bali Nomor 97 Tahun 2018*. Implementation analysis is needed in a policy to find out the problems that arise during the implementation process in the field. By doing the analysis, it can provide input on improving the implementation process.

Table 2. Increasing the Use of Single-use Plastics in Districts/Cities in Bali

No.	County/City	Data
1	Karangasem	The first semester of 2019 the volume of single-use plastic waste in Karangasem Regency was 44,570 kg then increased to 57,756 kg in the following semester (Suriyani, 2020)
		The use of single-use plastic in Karangasem is still high which causes the generation of plastic waste. Traditional markets are said to be the largest producer of plastic waste. Almost 50 percent of the waste sent to the Final Disposal Site (TPA) consists of plastic (Bali Express, 2019).
2	Buleleng	The first semester of 2019 the volume of single-use plastic waste was around 48,000 kg then increased to more than 50,000 kg in the following semester (Suriyani, 2020).
3	Badung	Plastic waste on Kuta Beach comes from settlements whose waste is not managed properly (CNN Indonesia, 2021).
		The accumulation of garbage in the Kuta Beach area is an annual problem. Now more and more plastic waste is found. He said the garbage came from residential areas (Alimudin, 2021)

B. LITERATURE REVIEW

Definition of Single-use Plastic

Single-use plastic products (SUPs) have many definitions from various institutions in the world. Simply put, single-use plastic is a group of plastics/plastic products that are used only once or very briefly and then disposed of as waste. According to UN Environment, plastics, which are generally made from fossil raw materials, are lightweight, hygienic, resistant and can be printed in various ways and are used in various applications. Most plastics do not decompose, but instead undergo photodegradation, which means that they slowly break down into tiny fragments known as microplastics. Single-use plastics which are also often referred disposable plastics are usually used for packaging and are intended to be used only once before being thrown away or recycled such as shopping bags, food packaging, bottles, straws, containers, glasses, and utensils. *Peraturan Gubernur Bali Nomor 97 Tahun 2018* defines single-use plastic as all forms of tools/materials made of or containing plastic, synthetic latex or polyethylene, thermoplastic synthetic polymeric and intended for single use use. Furthermore, this regulation only focuses on three types of plastic, namely plastic bags, setyrofoam, and plastic straws.

Disposable plastic bags are used to carry goods and are usually given to customers at points of sale. The most common shopping bags are made of a type of plastic called synthetic resin polyethylene which is hard, light, and flexible. Single-use polystyrene foam products or foamed plastics and better known as styrofoam is the most widely used material for producing food containers because of its rigidity, light weight, and good heat insulation properties. The rapid increase in the use of single-use plastics has a negative impact on environmental, health and social conditions, as well as the economy.

Environmental impact

Single-use plastics that pollute the environment can pose a hazard to wildlife as they may be ingested or entangled. Due to their light weight and balloon-shaped design, plastic bags are easily blown into the air and end up in nature. Plastic bags can also clog drains and cause flooding. In addition, the toxic chemicals added during the single-use plastic manufacturing process pass from ingested plastic into animal tissues, eventually entering the food chain to humans. As plastic breaks down into microplastic particles, it becomes increasingly difficult to detect and remove it from the open ocean (United Nations Environment Programme, 2018, pp. 12-13). Indonesian Institute of Sciences (LIPI) in 2019 revealed that microplastics have entered the human body through marine animals that are eaten by the public. Furthermore, it is said that all marine biota in Indonesian waters ingest microplastics (The Jakarta Post, 2019).

Health and Social Impact

Styrofoam contain toxic chemicals such as styrene and benzene. Both ingredients can cause health complications including adverse effects on the nervous, respiratory, reproductive, kidney, and liver systems. Toxins in Styrofoam containers can transfer to food and drink, and this risk appears to be exacerbated when people reheat food while it is still in the container. In poor countries, plastic waste is often burned for cooking purposes which can result in toxic emissions.

The practice of illegally disposing of plastics often takes the form of open burning, which accentuates the release of toxic gases into the air. In addition, littering of plastic waste can cause welfare losses, for example related to views contaminated with garbage. This is an indirect social cost of plastic pollution. In areas with inadequate solid waste management, plastic waste can block sewage systems and provide breeding grounds for mosquitoes and other pests, increasing the risk of transmitting vector-borne diseases such as malaria. In addition, diseases that may arise due to ingestion of microplastics by humans. Little is known about the exact impact of microplastics on human health (United Nations Environment Programme, 2018, p. 14). In terms of health and social impacts, the current pandemic has also contributed to the increasing amount of plastic consumption and waste. In a survey conducted in 41 countries regarding the use of single-use plastic during the pandemic, as many as 58 percent said their consumption was increasing. The majority is on the increase in the use of masks and then followed by an increase in food packaging by 50 percent and single-use plastic bags by 35 percent (Filho, Salvia, Minhas, Paço, & Dias-Ferreira, 2021). LIPI revealed that during the pandemic there was an increase in plastic waste due to increased shopping transactions and online food delivery services (Liputan6, 2021).

Economic Impact

Areas with economic dependence on the tourism sector require cleaning costs due to plastic waste on the environment. The Asia-Pacific Economic Cooperation (APEC) estimates the economic impact of 1.3 billion dollars. In addition, recycling styrofoam products costs a lot because it is technically difficult to do. Styrofoam usually cannot be recycled locally but must be transported to a centralized plant. In addition, 95% of Styrofoam is air, so it is not cost-effective to store or ship for recycling purposes. Due to the porosity of foamed plastic products, cleaning such products, which are often contaminated with food or drink, is difficult and consumes a lot of energy, which further increases recycling costs (United Nations Environment Programme, 2018, p. 15).

The Development of Single-use Plastic Policy

As an answer to the problem of plastic waste, several countries in the world have begun to take decisive steps to solve it. Policy interventions to reduce single-use plastic bags and styrofoam products have been implemented at the national and regional levels. Countries around the world have introduced different policy tools such as ban policies or economic instruments such as taxes. According to the UN Environment, there are three policy tools that can be used to limit the consumption of plastic bags, namely regulatory, economic, and combination instrument (Table 3).

A similar opinion regarding policy instruments to reduce the amount of plastic waste was also conveyed by Wagner (2017). In his research, there are three additional instruments, referred to as approaches, namely through specific bag designs, consumer education, and plastic returns. In addition, each instrument also has its own advantages and disadvantages. Furthermore, in his research it is said that the prohibition instrument is the most effective policy in suppressing plastic consumption. The combination of a prohibition policy and the imposition of fees

is said to be even more effective. The explanation regarding the Wagner instrument is described in Table 4.

Around the world, this type of ban is divided into three groups, namely a group of countries that do not implement a plastic ban at all, such as Indonesia, a group of countries with a partial (partial) plastic ban, and a group of countries with a full plastic ban. Partial plastic bans have quite a variety of meanings, for example plastic ban are applied to certain types of plastic based on material, color, weight, or thickness. Some countries that implement a partial ban such as Nepal, India, Italy, and France. The ban that is said to be full is a ban that covers all types of plastic without exception. The number of countries implementing full bans is still rare, most combining partial bans with market schemes through the imposition of taxes or surcharges.

Table 3 Policies to Limit Single-use Plastics according to the UN Environment

No.	Policy Tool		Information
1	Regulatory Instruments	Prohibition	The prohibition on certain types of single-use plastic can be total or partial with certain specifications.
2	Economic Instruments	Charges to producers	Retribution paid by plastic bag suppliers (domestic producers or importers). To be effective in driving behavior change, these costs must be passed from suppliers to retailers so that (i) charge consumers for plastic bags or (ii) offer discounts/gifts to consumers who do not ask for plastic bags.
		Charges to retailers	The levy that retailers have to pay when buying plastic bags.
		Imposition of fees on consumers	The cost for each bag sold at the point of sale; standard price determined by regulation
3	Combination Instrument	Prohibition and imposition of fees	Combination of bans and fees

Source: UN Environment (2018)

Table 4 Policies to Limit Single-use Plastics according to Wagner

No.	Instrument	Information	Advantages	Disadvantages
1	Prohibition	Retailers are prohibited from providing single-use plastic bags	The most effective approach in reducing plastic consumption and easy to implement	With bans, an increase in consumption of non-banned bags will occur unless there is a charge for non-

				banned bags. Prohibition of eliminating consumer choice
2	Taxes and Fees	The additional cost of using single-use plastic	Reduce consumption and plastic waste. Taxes can be compensated to fund anti-waste programs. Relatively easy to implement and also retain consumer choice	Increased costs to consumers and increased administrative costs to regulators and retailers. The new tax is generally not popular.
3	Specific pocket design	Make specifications of allowed plastics such as thickness, content, and recycling potential. Very difficult to enforce.	Can reduce environmental impact and increase recycling opportunities.	Very difficult to implement. Increase retailer costs because these types of plastic are more expensive and do not necessarily reduce consumption and recycling rates
4	Consumer Education	Educate consumers about reducing consumption or increasing recycling	Low cost and no limits on consumers	It is difficult and expensive to implement sustainably and in the long term. The impact is still doubtful on changes in consumption levels
5	Plastic Return	Retailers are required to return plastic bags from consumers for recycling	Rely on consumer voluntary action to return bags. Does not charge	Increased costs for retailers.

			consumers	

Source: Wagner (2017)

The *Peraturan Gubernur Bali Nomor 97 Tahun 2018* is a step to suppress the use of single-use plastic through a regulatory instrument in the form of a partial ban because it only prohibits three types of single-use plastic. There is no discussion of economic instruments in it. In addition, the regulations also provide counseling which is part of the consumer education approach. In general, policies that prohibit people from using single-use plastics are known as plastic ban policies. The plastic ban policy is a regulatory policy because it aims to change people's behavior from those who usually use plastic to not use it.

Environmental Policy Implementation Analysis

The five stages of public policy have an important role in the success of a policy. Some researchers consider the implementation stage is the main stage that will determine the success of a policy. In Webster's great dictionary (Wahab, 2005), to implement means to provide the means for carrying out (providing the means to carry out something), and to give practical effect to (to have an impact/effect on something). Edward III said that without effective implementation the decisions of policy makers will not be successfully implemented. Policy implementation is an activity that is seen after a valid direction has been issued from a policy which includes efforts to manage inputs to produce outputs or outcomes for the community.

In the Handbook of Public Policy Analysis, it is stated that there are three generations of implementation research. The first generation of implementation studies, which dominated most of the 1970s, was characterized by a pessimistic tone. This pessimism is fueled by a number of case studies that represent examples of failed policy implementations. The most important achievement of the first generation was to increase awareness of the importance of studies and research on implementation issues in the wider community. The second generation began to propose various theoretical frameworks and hypotheses. This period was marked by a debate between top-down and bottom-up approaches to implementation research. The top-down perspective understands implementation as the execution of policies based on a hierarchy of centrally defined policy objectives. Whereas, bottom-up perspective emphasizes that implementation consists of day-to-day problem solving strategies through bureaucratic approaches at lower levels. Third-generation implementation research attempts to bridge the gap between top-down and bottom-up approaches by incorporating concepts and thoughts from both approaches. The aim of the third generation of research is to make implementation study research more scientific. The previous three generations of implementation research can be divided into three distinct theoretical approaches to implementation studies: 1) The top-down model places a major emphasis on the ability of decision makers to produce clear policy objectives and on controlling the implementation phase; 2) Bottom-up views local bureaucrats as the main actors in policy delivery and considers implementation as a negotiation process within the implementing network; and 3) Hybrid theory attempts to address the gap between the other two approaches by incorporating

elements of top-down and bottom-up theoretical models (Pülzl & Treib, 2007, pp. 89-91).

The previous discussion shows that the top-down approach is more suitable in analyzing this research. There is a lot of thought regarding the development of a top-down approach. There are five main contributions to the development of the top-down approach (Hill & Hupe, 2002). The five contributions were put forward by Pressman and Wildavsky (1973), Van Meter and Van Horn (1975), Bardach (1977), Hogwood and Gunn (1978), and Sabatier and Mazmanian (1979). The five studies have their own characteristics, but Sabatier and Mazmanian (1979) are considered the most suitable for environmental policy analysis because the literature explicitly states the influence of their factors on environmental policy.

Classical policy implementation ideas tend to demand a near-perfect policy implementation. Starting from the concept of deficit implementation presented by Wildavsky or the factors presented by Sabatier and Mazmanian. The development of studies related to policy implementation shows that the perfection demanded by these classical ideas is difficult to achieve, especially for developing countries which have limited resources and socio-economic problems that are more complex and urgent.

Environmental policy entered a major phase in the late 1960s and early 1970s, following the publication of a number of influential works documenting the severity of environmental degradation worldwide. The concept of environmental policy is very close to the concept of sustainable development. According to Brundtland, sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs or known as our common future. Sustainability is a mechanism that stipulates four conditions, namely 1) do not mine materials faster than nature can produce; 2) do not produce substances faster than nature can decompose naturally; 3) does not harvest renewable energy faster than it is recharged, and 4) human needs must be met fairly and efficiently (Cocklin, 2009). The single-use plastic ban policy is part of environmental policy to limit the addition of plastic waste, while the duration of decomposition by nature is very long.

Environmental policies, including policies related to single-use plastics, have the same tendency towards implementation problems. As pointed out by Sharp, Daley, and Lynch (2010), adopting or passing environmental policies is less likely to be politically controversial, especially when the policies have good merit and purpose. On the other hand, policy implementation requires concrete government action, which is likely to fuel opposition interests and demand that the government mobilize organizational and economic resources. It is at this stage of the policy process that the aforementioned gaps between design and implementation become clearer and deeper.(Sharp, Daley, & Lynch, 2010).

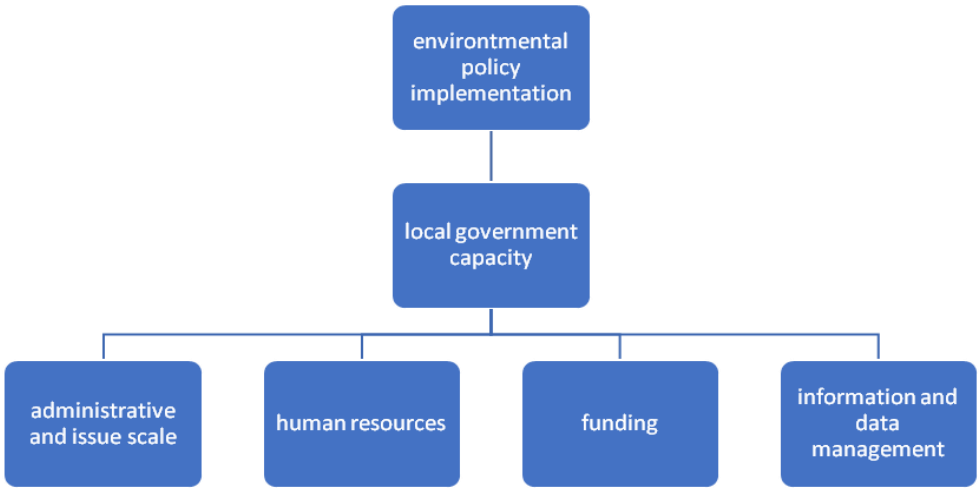


Figure. 3 Local Government Capacity Factors
Source: Ryan (2015)

Furthermore, Ryan (2015) in his research using literature studies describes an efficient pattern in conducting research on policy implementation related to the environment, in his research related to climate change policy. The research focuses on the capacity of policy implementation at the city level. His study states that there is a tendency for literature on environmental policy issues at the city level to fall into the "everything matters" trap, which considers all variables to be important and must be met but does not take into account the limitations of regional resources, especially in developing countries. Thus, his research tries to create a specific concept that is more realistic and efficient in researching environmental policies at the local level. He provides three key factors that influencing implementation namely local government capacity, local framing, and political factors and actors (Figure. 3).

Local government capacity

Local government capacity is defined as the ability of local governments to form policies, laws and regulations related to environmental policies. In addition, this factor is also closely related to the resources owned by the local government. There are three types of resources that greatly affect the capacity of local governments to implement environmental policies, namely funding, human resources, and information management. Furthermore, in his writings, Ryan (2015) measures the capacity of local governments in four ways, namely 1) administration and problem coverage; 2) human and technical resources; 3) funding; and 4) data and information management.

The difference in the amount of funding and human resources in carrying out supervision has a significant impact on the effectiveness of local programs related to the environment. Funding will become a more critical issue if decentralization is applied to the area. Then, information management relates to the potential impact of environmental damage and social conditions of the

community that can affect the ability of local governments to design and implement effective adaptation measures.

Local framing

The essence of the local framing factor is the alignment between the objectives of the environmental policy and the social and economic problems experienced by the community where the policy is implemented. This claim is based on the hypothesis that local governments and communities are more likely to develop and promote environmentally friendly policies if they can be framed in terms of local issues and are capable of generating social, economic and environmental benefits.

Political factors and actors

This condition focuses on how political factors and actors influence the development of environmental policies at the local level. Measuring opportunities for political leadership to promote environmental policies. Generally, these are senior local government officials who take on a leadership role in promoting the agenda on environmental issues. Bulkeley and other experts (2009) argue that overcoming administrative and political barriers requires broader institutional capacity. In addition, the high level of activity of the environmental community is likely to facilitate policy implementation. Furthermore, the influence of political actors according to Ryan (2015) can be seen in the following ways: 1) promotion of involved actors; 2) coalition of supporters and opposition to environmental policies; and 3) interfere with political parties.

Ryan (2015) in his research also adds that the local government capacity factor is considered a necessary condition in implementing environmental policies. These necessary conditions are the initial conditions that must be met in implementing the policy. Based on this explanation, this research will look at the capacity of local governments in implementing policies to limit the use of single-use plastics in Bali Province.

C. METHOD

Based on the formulation of the problem and the objectives that have been set previously, the research method used is a qualitative research method. Qualitative research is research that aims to understand the condition of a context by leading to a detailed and in-depth description of the portrait of conditions in a natural context (natural setting), about what actually happened according to what was in the field of study. Qualitative research is suitable in expressing several things such as interest, positive attitude, and motivation towards an object. The purpose of qualitative research is to understand a context with a detailed and in-depth description of what actually happened in the field (Nugrahani, 2014, p. 87). In qualitative research, information is extracted in depth and detail.

In this implementation research, the use of qualitative research methods is carried out to analyze and explore single-use plastic ban policies in the Province of Bali. This study will describe descriptively the conditions of implementation in the field and provide recommendations according to the research objectives.

Informants in qualitative research are those who are involved in the phenomenon being studied and are expected to be able to provide information and

data to answer research problems. The selection of informants is very influential on the information obtained, because the selection of inappropriate informants will produce invalid information and data, causing the wrong conclusions to be drawn. The selection of informants was carried out on a purposeful basis, namely by analyzing the actors involved based on *Peraturan Gubernur Bali Nomor 97 Tahun 2018*.

Table 5. List of Informants

No.	Informant	Information
1	Dra. Ni Nyoman Wiratni, MM	Secretary of the Bali Provincial Forestry and Environment Service
2	I Made Dwi Arbabi, S.Tp, M, Si	Head of Hazardous Waste Management & PPKLH
3	Bu Catur, environmental NGO	Director of the Center for Environmental Education (PPLH) Bali
4	Bu Anggreni	Disposable Plastic Distributor/Distributor Store Owner
5	Pak Mika	Community public informant

Then, research interviews were conducted on research subjects who understood and correlated directly with the research problem. The determination of informants by researchers is based on seeking information about who is involved and contributes to the implementation of the single-use plastic ban policy in Bali Province. The following is a list of informants selected by researchers in Table 5.

D. EXPLANATION

The success of a policy really depends on how the process of implementing the policy is. This is the main reason for this study to discuss the implementation of the policy on the use of single-use plastics in the province of Bali. The analysis in this study uses two main approaches sourced from the writings of Ryan (2015). This study discusses the local government capacity factor. This aspect is important because the policy on the use of single-use plastic does not come down directly from the national level. Existing national policies do not explicitly call for restrictions on the use of single-use plastics. Thus, the decision to implement this policy can be said to be a local government initiative. Besides that, Regional capacity is considered a necessary condition in implementing environmental policies according to Ryan (2015). Furthermore, local government capacity consists of 1) administrative and problem scale; 2) human resources; 3) Funding; and 4) Information and Data Management.

Administration and Problem Scale

A good policy is a policy that is able to describe its policy objectives well. In addition, the existence of policy objectives is also an indicator that can be used to measure the success of policy implementation. From the existing document literature, this single-use plastic restriction policy is a policy that aims to reduce waste that has a negative impact on the environment and further ensures a good

and healthy environment for the community. Improving the quality of life of the people now and in the future is also the main goal of this policy.

> "The reason why the single use plastic policy was formed is to follow the Restrada instructions, household waste reduction. The percentage of handling and processing is different so which one we want to suppress, through plastic waste because it is also very dangerous if it returns to nature. Related to that, how do we reduce waste in accordance with the targets in *Peraturan Presiden Nomor 97 Tahun 2017*. (Interview, government informant, Dinas Kehutanan dan Lingkungan Hidup Provinsi Bali)

The determination of this policy is a realization of the Regional Strategic Plan (Restrada) of the Bali Province, namely reducing household waste. This policy was also taken because it saw the ability of the region in options to reduce the amount of waste in the community. According to Godfrey (2019), the government has three choices in an effort to reduce plastic waste, namely banning, recycling, and collecting. The research also states that the three options must be adjusted to the government's ability to obtain optimal results.

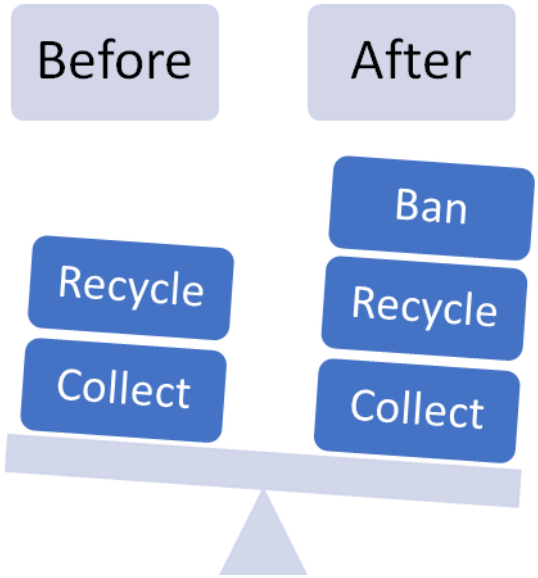


Figure 4. Strategies Local Government in Waste Management

Furthermore, this policy is also expected to be the answer to the problem of waste accumulation that occurs at the Final Disposal Site (TPA). Limited land is an obstacle for the government in collecting waste. This is also supported by the statement of the Governor of Bali quoted from the Detik.com page regarding the limitation of the use of the TPA Sarwagita (Detik.com, 2022). TPA Sarwagita is the largest TPA in Bali province because it manages the most densely populated area in Bali.

> "The governor forbids the use of regional TPA because we have limited land, so every village should manage organic waste because it

> is still capable of being managed, and those that cannot be managed go to the TPA. TPA should only accommodate waste that cannot be managed in the village, not all types of waste" (Interview, government informant, Dinas Kehutanan dan Lingkungan Hidup Provinsi Bali)

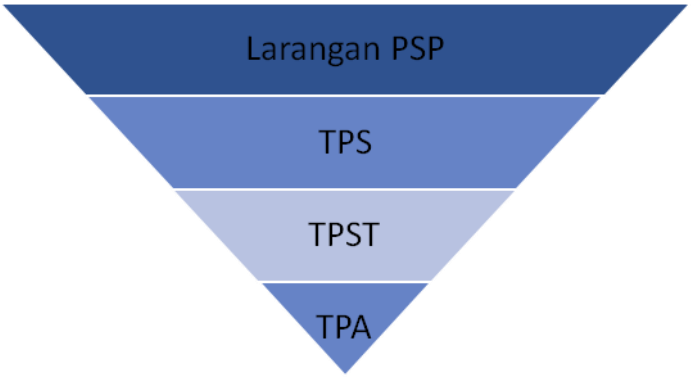


Figure 5. The role of the PSP ban policy on waste reduction

The presentation can be summarized into an inverted pyramid diagram, where the single-use plastic policy is at the top of hierarchy (figure 8). The picture shows that the single use plastic ban policy is the first that faced by the community and can reduce the amount of plastic waste. With the reduction in the amount of plastic waste, it is followed by a reduction in plastic waste in Temporary Disposal Sites (TPS), Integrated Waste Disposal Sites (TPST) and ends in reducing waste in TPA. So that the landfill will not accommodate a large load.

Furthermore, the main objective of this policy is to reduce waste and follow national waste reduction instructions and change people's behavior. Improvement in the tourism sector is an indirect goal of implementing this policy.

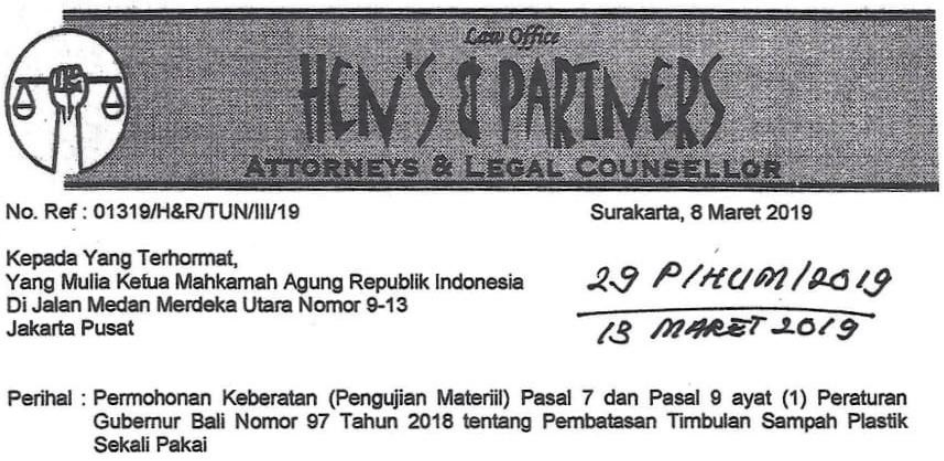
> "Actually, we don't directly have an impact on tourism, but the focus is on environmental conditions and people's behavior even though plastic waste looks small, but changes in people's behavior can help reduce waste in the environment" (Interview, government informant, Dinas Kehutanan dan Lingkungan Hidup Provinsi Bali)

Behuria's research (2021) concludes that the policy objectives of single-use plastic restrictions greatly affect the level of strictness and consistency of the implementation of these regulations. Tourism areas that consider plastic pollution to have a major impact on economic conditions will apply it strictly. The conditions that occur in the province of Bali are different from those found by Behuria (2021). In his research, Rwanda, which is an area with a large tourism sector, applies a policy of restricting single-use plastics strictly because they think it can affect the country's economy. is waste reduction. This could lead to an easing in the implementation of the policy to limit the ban on single-use plastics. In addition, the absence of intense competition in attracting tourists from

neighboring provinces is the driving force for the tourism-economy concept that occurred in Rwanda, did not occur in Bali Province.

Whether or not a policy is easy to implement is influenced by the size or extent of the problems faced. The scale of the problem according to Mazmanian and Sabatier (1980) can be seen from the level of change to be achieved from the implementation of a policy. Furthermore, the magnitude of the expected behavior change is also a reference in viewing the scale of the problem. Based on an interview with the Head of Waste Management, Hazardous Waste and PPKLH, I Made Dwi Arbani, information was obtained regarding the scale of the problem in policy implementation. Barriers to implementation arise from private parties representing producers, distributors, and plastic recycling association groups. They requested a judicial review at the Supreme Court for the issuance of *Peraturan Gubernur Bali Nomor 97 Tahun 2018*. Some of the reasons used to challenge the Governor's Regulation are that the regulation can close or reduce people's sources of income. This shows that there is serious resistance from business groups in implementing the policy.

> "I tried to tell the story from the beginning, so when we came the policy out, we were sued directly by several organizations, it was a plastic factory, plastic distribution, and plastic recycling group about human rights, they said, forbidding people from selling to get income because this can certainly be done recycled, they arrived at the Supreme Court and coincidentally they lost and so the policy can still be continued" (Interview, government informant, Dinas Kehutanan dan Lingkungan Hidup Provinsi Bali)



Law Office
HEN'S & PARTNERS
ATTORNEYS & LEGAL COUNSELLOR

No. Ref : 01319/H&R/TUN/III/19 — Surakarta, 8 Maret 2019

Kepada Yang Terhormat,
Yang Mulia Ketua Mahkamah Agung Republik Indonesia
Di Jalan Medan Merdeka Utara Nomor 9-13
Jakarta Pusat

29 P/HUM/2019
13 MARET 2019

Perihal : Permohonan Keberatan (Pengujian Materiil) Pasal 7 dan Pasal 9 ayat (1) Peraturan Gubernur Bali Nomor 97 Tahun 2018 tentang Pembatasan Timbulan Sampah Plastik Sekali Pakai

Figure 6. Application for Objection
Source: Dinas Kehutanan dan Lingkungan Hidup Provinsi Bali

Based on the explanation, the problems faced in implementing this policy include the problem of limited land for waste storage, changes in community

behavior, and resistance from related business groups. These three problems can be said to be very broad and cover many interests.

Funding

Based on an interview with I Made Dwi Arbani, it is known that in general, the source of funds for the implementation of this policy mostly comes from PAD, central funds through PAU are mostly used for activities that produce physical results, such as TPST. In addition, fund support from private sector is very small in number.

> "If our funds can't go down on their own, there's a lot that we haven't done yet. We ask for cooperation from the private sector, we've worked with several private companies but the amount is very small, they gave reusable bags, but the implementation is still from our budget" (Interview, government informant, Dinas Kehutanan dan Lingkungan Hidup Provinsi Bali)

As an effort to manage limited and efficient funds, the Department of Forestry and Environment implements collaboration with several OPDs and the government at the district/city level regarding policy targets.

> "For example, we give it to the OPDs in charge of, for example, cooperation with the industry, tourism, education office, if indeed the socialization is to schools, we approach the education office so that they move." (Interview, government informant, Dinas Kehutanan dan Lingkungan Hidup Provinsi Bali)

During the Covid-19 pandemic, greater savings were made, these savings also had an impact on policy implementation, but still implemented a priority system in densely populated areas. This was conveyed by the Secretary of the Department of Forestry and Environment, Ni Nyoman Wiratni. In addition, according to the director of PPLH Bali, the study and discussion meeting related to this policy used sharing funds from several organizations, one of which was the Bali Provincial Forestry and Environment Service.

Human Resources

In this study, Human Resources will be described in two groups, the first is the implementer of the activity and the second is the support from higher officials. The implementers of the regulations have been clearly defined in the previous section, consisting of the in charge group from the Forestry and Environment Office. Then, followed by a support group from related agencies. The support of higher officials according to Ryan (2015) functions in ensuring whether implementation can proceed as planned at the beginning. In addition, the support of high-ranking officials can also reduce political obstacles. Based on the results of interviews with Ni Nyoman Wiratni and I Made Dwi Arbani, it is known that the Governor of Bali, I Wayan Koster, has a role in the implementation of this policy.

Information and data management

Information and data management are used as scientific indicators in policy implementation. The existence of strong information and data support can support

the success of policy objectives. In this regard, the agency's ability to supervise the regulations that are made is one of the important things to determine community compliance and related to the next step. Supervision is a way of implementing regulations in seeing people's compliance with a regulation. The supervision process is usually accompanied by a system of sanctions that are expected to have a deterrent effect on the community. With regard to single-use plastics, the previous literature related to surveillance is discussed in Baradwaj (2016). In his research concluded that strict supervision, the existence of fines, and the total ban type will give better results. Another interesting conclusion from this study is that partial and total prohibitions are said to be ineffective in reducing the use of plastic bags even though the budget costs incurred in implementing both, partial and total, are not much different. In the Governor's regulation Number 97 of 2018 it is written that there are sanctions for violating these rules, but the explanation regarding these sanctions is not explained.

The lack of clarity about the sanctions is the cause of the emergence of violations in the community. This was also confirmed through interviews with the community and distributors of single-use plastics that they did not know or had never heard that there were people who were penalized for violating the regulation.

> "I never knew about the sanctions, I never saw it. Maybe the small enterprise who are penalized are not the general public (interview, single use plastic distributor)"

According to the head of the field, I Made Dwi Arbani, the sanctions have not yet been applied. So far, it has only been an appeal, including for single-use plastic distributors. Plans for the application of sanctions already exist but have not yet been implemented. In the initial implementation of the regulation, we did visit plastic distributors, but the purpose was only to collect data.

> "If we talk about sanctions, there are no sanctions yet because right now it is still at the level *Peraturan Gubernur*, we have a plan to raise it in the form of a Peraturan Darah so that we can impose administrative sanctions, for example cooperation with the Satpol PP for supervision. In the future we really have a lot of expectations, we have made a lot of plans, for example, making administrative sanctions or we cooperation with investors or other innovations" (Interview, government informant, Dinas Kehutanan dan Lingkungan Hidup Provinsi Bali)

This study found that the analysis of the capacity of local governments in implementing plastic management policies, was strong enough and succeeded in explaining the concept, and causality relationships to achieve goals. The novelty of this research is that the implementation of this management policy is successful due to factors including: administration and problem scale, funding, human resources, and information and data management.

E. CONCLUSION

The explanation above shows that the four factors of local government capacity have their respective roles in policy implementation. The first factor, administration and the scale of the problem indicate that the local government has been able to explain the causal relationship between the policy objectives and the steps taken to achieve the objectives. The steps taken by limiting the use of single-use plastics are the right steps to increase waste management options from only collecting and recycling. This combination, according to Godfrey (2019), is very much needed by considering the capabilities of local governments. Seeing the limitations of land, the local government decided to issue a policy in the form of a ban. This section shows that local governments are able to explain the causal relationship of the policy objectives to be achieved. The scale of the problems faced in implementing this policy is quite wide. Local governments are faced with the problem of limited land for urgent waste collection, behavioral changes made worse by the Covid-19 pandemic, as well as rejection from economic groups.

The funding factor shows that local governments have been able to apply efficient funding methods by implementing collaboration. This efficiency also shows that local governments have tight budgets for this policy. Furthermore, the human resource factor has an opportunity from the Governor's role in this policy. This opportunity should be utilized to improve the quality of implementation. Finally, information and data management factor shows a considerable lack. The supervision and sanctions written in the regulations have not been carried out which has caused a decrease in the level of community compliance.

Finally, the implementation of *Peraturan Gubernur Bali Nomor 97 Tahun 2018* is a policy that is conceptually good. This policy is able to explain the causal relationship regarding the ways taken to reduce waste, namely by collaborating between banning, recycling, and collecting. Then, from the sustainability of the program, this policy is in accordance with the mandate of environmental policies at the national and international levels. However, the implementation of this policy is still not in accordance with the mandate written in the regulations, single-use plastic is no longer difficult to find in public. The main factor causing this setback to occur is the lack of strict supervision and sanctions. This policy has a great opportunity to be implemented properly.

F. REFERENCES

Alimudin, R. (2021, Januari 1). *Pikiran Rakyat*. Diambil kembali dari Didominasi Sampah Plastik, Petugas Gabungan Angkut 30 Ton Sampah dari Pantai Kuta: https://bekasi.pikiran-rakyat.com/nasional/pr-121199303/didominasi-sampah-plastik-petugas-gabungan-angkut-30-ton-sampah-dari-pantai-kuta?page=2

Bali Express. (2019, Oktober 22). *Bali Express*. Diambil kembali dari Sampah Plastik Makin Merongrong, DLH Karangasem Pikir-pikir: https://baliexpress.jawapos.com/bali/22/10/2019/sampah-plastik-makin-merongrong-dlh-karangasem-pikir-pikir

BBC.com. (2018, Maret 7). *Bali's battle against plastic pollution*. Diambil kembali dari bbc.com: https://www.bbc.com/news/world-asia-43312464

CNN Indonesia. (2021, Januari 2). *CNN Indonesia*. Diambil kembali dari Eks Wamenlu Keluhkan Sampah di Pantai Legian: Buruk Sekali: https://www.cnnindonesia.com/gaya-hidup/20210102193519-269-588782/eks-wamenlu-keluhkan-sampah-di-pantai-legian-buruk-sekali

Cocklin, C. (2009). Environmental policy. Dalam R. Kitchin, & N. Thrift, *International Encyclopedia of Human Geography* (hal. 540-545). Townsville: Elsevier .

Detik.com. (2011, April 5). *Time Sebut Bali 'Neraka', Pemprov Bali Protes*. Diambil kembali dari Detik.com: https://news.detik.com/berita/d-1609288/time-sebut-bali-neraka-pemprov-bali-protes

Detik.com. (2022, April 18). *Koster Segera Tutup TPA Suwung*. Diambil kembali dari Detik.com: https://www.detik.com/bali/berita/d-6037620/koster-segera-tutup-tpa-suwung

Filho, W. L., Salvia, A. L., Minhas, A., Paço, A., & Dias-Ferreira, C. (2021). The COVID-19 pandemic and single-use plastic waste in households: A preliminary study. *Science of The Total Environment*. doi:doi.org/10.1016/j.scitotenv.2021.148571

Godfrey, L. (2019). Waste Plastic, the Challenge Facing Developing Countries—Ban It, Change It, Collect It? *Recycling*, 3. doi:10.3390/recycling4010003

Hill, M., & Hupe, P. (2002). *Implementing Public Policy.* London: SAGE Publications.

Lamb, K. (2018, Maret 6). *'Plastic, plastic, plastic': British diver films sea of rubbish off Bali*. Diambil kembali dari The Guardian: https://www.theguardian.com/world/2018/mar/06/plastic-british-diver-films-sea-rubbish-bali-indonesia

Liputan6. (2021, Januari 11). *LIPI: Jumlah Sampah Plastik Melonjak selama Pandemi Covid-19*. Diambil kembali dari Liputan.com: https://www.liputan6.com/bisnis/read/4454386/lipi-jumlah-sampah-plastik-melonjak-selama-pandemi-covid-19

Marshall, A. (2011, April 9). *Holidays in Hell: Bali's Ongoing Woes*. Diambil kembali dari Time: http://content.time.com/time/world/article/0,8599,2062604,00.html

McIlgorm, A., Campbell, H. F., & Rule, M. J. (2011). The economic cost and control of marine debris damage in the Asia-Pacific region. *Ocean & Coastal Management, 54*(9), 643-651. doi:10.1016/j.ocecoaman.2011.05.007

Meijer, L. J., van Emmerik, T., van der Ent, R., Schmidt, C., & Lebreton, L. (2021). More than 1000 rivers account for 80% of global riverine plastic emissions into the ocean. *Science Advances, 7*(18). doi:doi:10.1126/sciadv.aaz5803

Murniati, N. (2020, November 11). Kepala Seksi Pengelolaan sampah Dinas Lingkungan Hidup Kabupaten Karangasem. (L. D. Suriyani,

Pewawancara) Dipetik 18 11, 2021, dari https://www.mongabay.co.id/2020/11/11/bali-kesulitan-mengurangi-plastik-sekali-pakai/

Nugrahani, F. (2014). *Metode Penelitian Kualitatif.* Surakarta: Cakra Books.

Pülzl, H., & Treib, O. (2007). Implementing Public Policy. Dalam F. Fischer, G. J. Miller, & M. S. Sidney, *Handbook of Public Policy: Theory, Politics, and Methods.* New York: CRC Press, Taylor & Francis Group.

Purnaya, I. G., & Semara, I. M. (2018). Implementasi Kebijakan Pemerintah Terhadap Penataan Sungai Badung Dalam Upaya Pengembangan Pariwisata di Kota Denpasar. *Jurnal Ilmiah Hospitality Management*, 1-10. doi:10.22334/jihm.v8i2.132

Radarbali.id. (2021, Mei 9). *Radarbali.id*. Diambil kembali dari Konsumsi Kantong Plastik Naik, Pemprov Bali Panggil Pengelola Pasar: https://radarbali.jawapos.com/read/2021/05/09/260344/konsumsi-kantong-plastik-naik-pemprov-bali-panggil-pengelola-pasar

Ritchie, H., & Roser, M. (2018, September). Plastic Pollution. Diambil kembali dari Our World in Data: https://ourworldindata.org/plastic-pollution

Sharp, E. B., Daley, D. M., & Lynch, M. S. (2010). Understanding Local Adoption and Implementation of Climate Change Mitigation Policy. *Urban Affairs Review*, 433–457. doi:10.1177/1078087410392348

SIPSN. (2020, - -). *SIstem Informasi Pengelolaan Sampah Nasional*. Dipetik November 25, 2021, dari Grafik Komposisi Sampah: https://sipsn.menlhk.go.id/sipsn/

Suriyani, L. D. (2020, November 11). *Bali Kesulitan Mengurangi Plastik Sekali Pakai*. Diambil kembali dari MONGABAY: Situs Berita Lingkungan: https://www.mongabay.co.id/2020/11/11/bali-kesulitan-mengurangi-plastik-sekali-pakai/

The Jakarta Post. (2019, Januari 17). *Microplastics have entered our bodies via food chain: Scientist*. Diambil kembali dari The Jakarta Post: https://www.thejakartapost.com/news/2019/01/17/microplastics-have-entered-our-bodies-via-food-chain-scientist.html

Tribunnews.com. (2021, Januari 4). *Pantai di Bali Dipenuhi Sampah Plastik Selama Musim Hujan, Capai 30-60 Ton Setiap Hari*. Diambil kembali dari Tribunnews.com: https://www.tribunnews.com/regional/2021/01/04/pantai-di-bali-dipenuhi-sampah-plastik-selama-musim-hujan-capai-30-60-ton-setiap-hari

United Nation Environment Programme. (2018). *Our planet is drowning in plastic pollution—it's time for change!* Dipetik November 19, 2021, dari United Nation Environment Programme: https://www.unep.org/interactive/beat-plastic-pollution/

United Nations Environment Programme. (2018). *SINGLE-USE PLASTICS: A Roadmap for Sustainability.* United Nations Environment Programme.

Vanapalli, K. R., Sharma, H. B., Ranjan, V. P., Samal, B., Bhattacharya, J., Dubey, B. K., & Goel, S. (2021). Challenges and strategies for

effective plastic waste management during and post COVID-19 pandemic. *Science of The Total Environment*. doi:10.1016/j.scitotenv.2020.141514

Wahab, S. A. (2005). *Analisis kebijaksanaan: Dari formulasi ke implementasi kebijaksanaan negara.* Jakarta: Bumi Aksara.

World Economic Forum. (2020). *Radically Reducing Plastic Pollution in Indonesia: A Multistakeholder Action Plan National Plastic Action Partnership.* Cologny/Geneva: World Economic Forum.