The Effect of Indonesian Leadership Period of The Minister of Maritime Affairs and Fisheries Toward Output

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ABSTRACT
Government Policy Should Align with the Blue Economy Concept, which advocates sustainable utilization of fisheries and marine resources without overexploitation and without compromising the ability of these resources to support future generations. This research aims to elucidate the influence of government policies on the output of Indonesia's fisheries and marine resources, examining the achieved outputs during the respective tenures of Indonesia's Ministers of Maritime Affairs and Fisheries from 1999 to 2020. This research employs a quantitative method with an explanatory approach. The data analysis technique employed is Linear Regression with Dummy Variables. Based on the analysis, the most significant contribution to fisheries and marine resource output was observed during the tenure of Minister Susi Pudjiastuti. Several policies implemented during her leadership period should be adopted and continued by the government, building upon what has been successfully executed and complementing them with additional policies.

Keywords: *Government Policy, Blue Economy Concept, Indonesia's fisheries and marine resources, Indonesia's Ministers of Maritime Affairs and Fisheries, Susi Pudjiastuti.*

1. INTRODUCTION

Indonesia boasts a greater expanse of maritime territory compared to its land area, yet the immense potential of its fisheries and marine resources remains largely untapped. The role of the government in preserving and developing the sustainability of these resources, as delineated in fisheries and marine policies, is indispensable. Government policies should ideally align with the concept of the Blue Economy, which advocates the sustainable utilization of fisheries and marine resources, refraining from overexploitation, and ensuring the preservation of these resources' capacity to support future generations. Several conservation policies are imperative to ensure their continued sustainability.

Adam and Surya argued that in certain regions, the exploitation being conducted tends to disrupt environmental balance, leading to a decline or even disappearance of certain fish resources in various Indonesian water regions [1]. Exploitation of fisheries resources can certainly bolster economic growth, but without a balance with conservation efforts, it will ultimately diminish its ability to meet the needs of future generations.

Policies concerning fisheries and marine resources are intrinsically linked to the role of the Minister of Maritime Affairs and Fisheries in making strategically sound decisions regarding programs related to the management of these resources. These programs are, of course, geared towards the welfare of the community. Several issues pertaining to the management of fisheries and marine resources are frequently discussed, including Resource Conservation,

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Productivity Enhancement, Social and Economic Impact, Food Security Improvement, Marine Environmental Protection, Conflict Management, Export Market Development, International Compliance, Climate Change Adaptation, as well as Transparency and Accountability. Studies focusing on more effective and sustainable policies for the management of fisheries and marine resources are crucial to support the fisheries sector and safeguard these invaluable marine resources.

Some researchers have analyzed how government policies can influence the management of fisheries and marine resources. Adam and Surya examined how sustainable fisheries development policies in Indonesia should be implemented [1]. Fajriana et al.found that Provincial Regulation No. 81 of 2017 had not yet had an impact on the catch results of fishermen in Nagari Guguak Malalo, possibly due to the severely diminished Bilih fish population as a result of exploitation without conservation efforts since 2012, which requires a considerable amount of time for recovery and improvement [2]. Kondo et al. noted that the economic dimension of the fishing industry in Kota Bitung, three years after the implementation of the moratorium and prohibition of transshipment, had not experienced positive developments. There were decreases in catch production for raw material for UPI, production per fisherman, UPI production, fishery exports, and the contribution of the fishery sub-category to the regional gross domestic product (PDRB) [3].

The establishment of fisheries development goals aimed at improving the welfare of the community often conflicts with other development objectives. The government must prioritize which development goals to pursue. Naturally, this decision is influenced by various factors, including political issues, cost-benefit ratios, external interests, and implementation hindrances. This research aims to elucidate how government policies impact the output of Indonesia's fisheries and marine resources. It examines the achieved outputs during the respective tenures of Indonesia's Ministers of Maritime Affairs and Fisheries from 1999 to 2020. Furthermore, among these ministerial periods, it describes the policies implemented by the minister who made the most significant contribution to the enhancement of fisheries and marine resource output. This information can then be recommended for continuation in the policymaking process for the subsequent periods.

2. METHODOLOGY

This research employs a quantitative method with an explanatory approach to elucidate the impact of the tenure of the Minister of Maritime Affairs and Fisheries on the magnitude of fisheries and marine resource output. The period under scrutiny spans from 1999 to 2020.

The data analysis technique utilized is Linear Regression Analysis with Dummy Variables. Dummy regression has several advantages, including: 1. The process of predicting the dependent variable is more focused and accurate, different from ordinary multiple regression, 2. Because the data is not qualitative, the prediction results are easier to interpret, and 3. The decision-making process tends to be easier [4].

In this study, the independent variable is the dummy variable representing the tenure periods of the Minister of Maritime Affairs and Fisheries, while the dependent variable is the fisheries and marine resource output. The Operational Definitions of Variables are outlined as follows:

Table 1. The Operational Definitions of Variables

Variable	Definition	Measure
OutFish	All results obtained from the capture or cultivation activities of fish or other aquatic animals/water plants, whether captured or harvested from natural fishery resources or from aquaculture facilities, whether operated by fisheries companies or household fisheries.	Fishing Output (Thousand Tons)
Dsar	Dummy Variable for the Sarwono Kusumaatmadja Leadership Period	Score 1, during the Sarwono Kusumaatmadja leadership period Score 0, if not
Drokh	Dummy Variable for the Rokhmin Dahuri Leadership Period	Score 1, during the Rokhmin Dahuri leadership period Score 0, if not

Dfred	Dummy Variable for the Freddy Numberi Leadership Period	Score 1, during the Freddy Numberi leadership period Score 0, if not
DFad	Dummy Variable for the Fadel Muhammad Leadership Period	Score 1, during the Fadel Muhammad leadership period Score 0, if not
DSha	Dummy Variable for the Sharif Cicip Sutarjo Leadership Period	Score 1, during the Sharif Cicip Sutarjo leadership period Score 0, if not
DSusi	Dummy Variable for the Susi Pudjiastuti Leadership Period	Score 1, during the Susi Pudjiastuti leadership period Score 0, if not
DSakt	Dummy Variable for the Sakti Wahyu Trenggono Leadership Period	Score 1, during the Sakti Wahyu Trenggono leadership period Score 0, if not

The following tentative equation is proposed:

$$OutFish_t = b_0 + b_1DSar + b_2DRokh + b_3DFred + b_4DFad + b_5Dsha + b_6DSusi + b_7DSakt + e$$

Where:

$OutFish_t$ = *Fishing Output*

$b_1, b_2, b_3, b_4, b_5, b_6, b_7$ = *Coefficient of Parameter*

DSar=Dummy Variable for the Sarwono Kusumaatmadja Leadership Period

DRokh=Dummy Variable for the Rokhmin Dahuri Leadership Period

DFred=Dummy Variable for the Freddy Numberi Leadership Period

DFad=Dummy Variable for the Fadel Muhammad Leadership Period

DSha=Dummy Variable for the Sharif Cicip Sutarjo Leadership Period

DSusi=Dummy Variable for the Susi Pudjiastuti Leadership Period

DSakt=Dummy Variable for the Sakti Wahyu Trenggono Leadership Period

Hypothesis testing is conducted using the F-test, t-test, and coefficient of determination (R^2). The F-test aims to assess whether all independent variables included in the model collectively influence the dependent variable. The criteria are as follows: if the significance level (α) of the F-test, obtained from the processed values, is less than 0.05, it can be concluded that all independent variables collectively influence the dependent variable, and vice versa. The t-test is employed to determine the individual influence of each independent variable on the dependent variable. The criteria are as follows: if the t-test probability is greater than α (0.05), there is no significant influence of the independent variable on the dependent variable, and vice versa. The Coefficient of Determination (R^2) is used to measure how effectively independent variables explain the dependent variable. If the R^2 value approaches 1, it indicates that the independent variables provide nearly all the information needed to predict the dependent variable.

3. RESULT AND DISCUSSION

2.1 Trend in Fisheries and Marine Resource Output

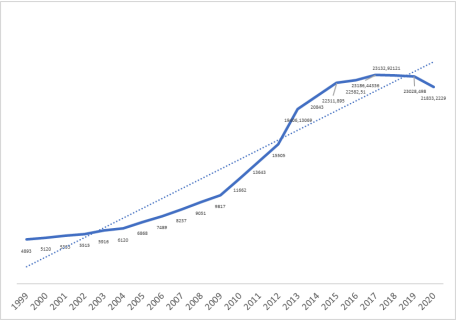

Figure 1 Trend in Indonesian Fisheries and Marine Resource Output from 1999 to 2020 (thousand tons)

Source: Indonesia Central Bureau of Statistics, 2023 [3]

The output of Indonesian Fisheries and Marine Resources from 1999 to 2020 showed an increasing trend. The periods of leadership for the Minister of Maritime Affairs and Fisheries varied, including Sarwono Kusumaatmadja from 1999 to 2001, Rokhmin Dahuri from 2002 to 2004, Freddy Numberi from 2005 to 2009, Fadel Muhammad in 2010-2011, Sharif Cicip Sutarjo from 2012 to 2014, Susi Pudjiastuti from 2015 to 2019, and Sakti Wahyu Trenggono during the leadership period from 2020 to the present [4].

2.2 Regression Analysis with Dummy Variables

The results of the F-test, t-test, and coefficient of determination (R^2) are presented in Table 1.

Table 2. Result of F-test, t-test, and coefficient of determination (R^2)

Variable	B	t	Sig.
(Constant)	8292.400	14.758	.000
DSar	-3170.400	-3.455	.004
DRokh	-2442.067	-2.661	.018
DFad	4360.100	4.148	.001
DSha	10292.310	11.217	.000
DSusi	14556.053	18.318	.000
DSakt	13540.823	9.838	.000
F	116.739		
Sig.	.000[b]		
R^2	.979		

Based on the results of the F-test, all independent variables included in the model collectively have a significant influence on the dependent variable, with an F significance level of 0.000, which is smaller than α (0.05). The t-test indicates that each independent variable individually has a significant influence on the dependent variable, with t probabilities smaller than α (0.05). The Coefficient of Determination (R^2) at 0.979 indicates that 97.9% of the independent variables provide the necessary information to predict the dependent variable. The results of the regression analysis with dummy variables, when written into an equation, are explained as follows.

$$OutFish_t = 8292.400 - 3170.400DSar - 2442.067DRok + 4360.100DFad + 10292.310DSha + 14556.053DSusi + 1$$

The equation can be interpreted as follows: the largest contribution to fisheries and marine resource output is during the leadership period of Susi Pudjiastuti, with the highest parameter coefficient of 14,556.053. The average fisheries and marine resource output during Susi Pudjiastuti's leadership period is 22,848.45 (14,556.053 + 8,292.400). The average fisheries and marine resource output during Sarwono Kusumaatmadja's leadership period is 5,122.00

(8,292.4 - 3,170.4). The average fisheries and marine resource output during Rokhmin Dahuri's leadership period is 5,850.33 (8,292.4 - 2,442.067). The average fisheries and marine resource output during Fadel Muhammad's leadership period is 12,652.50 (4,360.1 + 8,292.4). The average fisheries and marine resource output during Sharif Cicip Sutarjo's leadership period is 18,584.71 (10,292.31 + 8,292.4). The average fisheries and marine resource output during Sakti Wahyu Trenggono's leadership period is 21,833.22 (13,540.823 + 8,292.4). The average fisheries and marine resource output during Freddy Numberi's leadership period is 8,292.400.

2.3 Fisheries and Marine Resource Policy During the Leadership Period of Susi Pudjiastuti

The linear regression analysis with dummy variables significantly indicates that during the leadership period of Susi Pudjiastuti, there was the highest contribution to fisheries and marine resource output when compared to other ministers of maritime affairs and fisheries. Based on this, let us revisit the policies she implemented, which can serve as examples to be adopted in preserving fisheries and marine resources.

There were numerous controversies during Susi Pudjiastuti's leadership period regarding the fisheries and marine resource management policies she enforced. The crackdown on Illegal Fishing, including the practice of Sinking Illegal Fishing Vessels, generated a lot of debate. Illegal fishing not only relates to the extensive exploitation of fisheries and marine resources but also concerns the preservation of marine ecosystems. Not all leaders are willing to take such strong measures, and many factors can influence policy decisions, including political considerations. However, these policies yielded significant results in safeguarding Indonesia's territorial waters and protecting the wealth of fisheries and marine resources. Wikipedia (2023b) notes that these policies reduced fishing efforts by approximately 25%, and the output from fishing increased by around 14% [7]. In recent years, the frontline role of maritime law enforcement vessels in the assertion of sovereign claims in the South China Sea dispute has grown, incidents at sea involving maritime law enforcement and fishing vessels from different claimant states are a regular occurrence and have at times resulted in serious consequences [5]

There are no prohibitions regarding the utilization of fisheries and marine resources; they can be harnessed for the welfare of society. However, this utilization needs to be managed to prevent environmental degradation and ensure that it can be sustained for the long term, allowing future generations to also enjoy its benefits. Fishing activities are also expected not to harm marine ecosystems. During Susi Pudjiastuti's leadership period, she issued policies banning several fishing gear types through the issuance of Minister of Maritime Affairs Regulation No. 2 of 2015 and Circular Letter No. 72/MEN-KP/II/2016. Of course, these bans were enacted due to concerns that these fishing gear types could harm marine ecosystems. These fishing gear types could lead to the capture of unintended species, including small and immature fish that are not ready for harvesting. Therefore, continuous use of these gear types would eventually result in the depletion of the caught species. Additionally, they can harm coral reefs. In addition to the ban on certain fishing gear, a policy to eliminate fuel subsidies for fisheries was also implemented. This was aimed at reducing overfishing.

Regarding aquaculture, Susi Pudjiastuti introduced a policy prohibiting the export of lobster seeds. Exporting lobster seeds would provide short-term profits for Indonesia but benefit the importing countries in the long run. Large-scale exploitation of lobster seeds, capturing them and immediately exporting them, would lead to habitat damage and extinction. Therefore, Susi Pudjiastuti introduced a series of policies and procedures related to lobster seed cultivation, mandating that cultivation must be done within the country [6].

Overexploitation of fisheries and marine resources in the long term will permanently damage marine ecosystems if not addressed promptly. The sea requires time for fish populations, aquatic organisms, and the marine ecosystem to recover before they can be utilized again. In order to preserve and harmonize fisheries and marine resources, Susi Pudjiastuti implemented temporary closures of Fishing Zones in several areas of Indonesia. Of course, those who do not prioritize conservation activities may find these policies disruptive. In addition to temporary Fishing Zone closures, efforts to restore marine ecosystems included policies for coral reef planting programs aimed at rehabilitating damaged coral reef ecosystems.

The policy related to fishermen that was implemented focused on empowering them by enhancing their ability to manage fisheries resources. According to Doaly (2023), 80% of small-scale fishermen only receive education below the level of Junior High School (SMP), and approximately 1.3 million coastal community members are categorized as poor (12.5% of the national poverty total) [8]. Although there are significant fisheries and marine resources, they cannot be fully utilized for the welfare of the people. Structurally, these impoverished fishing communities lack the capacity to leverage the existing opportunities. Empowerment here encompasses not only how to catch or cultivate fish but also how to add value to fisheries and marine resource outputs and how to market them both nationally and internationally.

Based on the various policies implemented during Susi Pudjiastuti's leadership period, the government should continue what has been effectively executed and consider additional policies that can further increase the long-term utilization of fisheries and marine resource output. In a highly connected world, the possibility for localized fisheries conflict to escalate into 'systemic risks', where risk in one domain such as food supply can increase risk in another domain such as maritime security and international relations, is growing [9].

4. CONCLUSION

The leadership period of the Minister of Maritime Affairs and Fisheries has a significant influence on fisheries output. The greatest contribution to fisheries and marine resource output occurred during Susi Pudjiastuti's leadership period. Several policies that were implemented during her tenure should be adopted and continued by the government, building upon what has been effectively executed and considering additional policies that can further increase the long-term utilization of fisheries and marine resource output.

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