Protecting Biodiversity: The Importance of Understanding the Role of Government and Society in Human-Urban Wildlife Interaction in Indonesia

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Abstract. Indonesia is a tropical country that is endowed with high biodiversity. Ironically, it turns out that Indonesia is one of the countries with a high level of loss of biodiversity. Indonesia, especially in big cities like Jabodetabek, has experienced a high urban expansion. This change becomes, the occurrence of changes in wildlife to urban wildlife that increases the interaction between humans and urban wildlife. This paper examines the importance of urban wildlife in Indonesia by summarizing several multidisciplinary studies in order to gain a comprehensive understanding of the issues and problems that exist in Indonesian urban wildlife and how important the role of government and society is in Urban Human-Wildlife Interaction in Indonesia. Land conversion, ignorance and lack of knowledge about urban wildlife, likewise the influence of economic and political factors in regulation that are issues in urban wildlife in Indonesia. The dimensions are likely to be the main drivers of urban area management, and they need to be properly implemented and integrated in all phases of management.

1. Introduction

Indonesia is a country with high biodiversity because it is located in an area with a tropical climate and has tropical rain forests. It is known that globally Indonesia is home to 12% mammals, 16% reptiles and amphibians, 17% birds, 10% flowering plants, and 25% fish species. However, Indonesia turns out to be a country with a high level of risk of biodiversity loss [1] [2]. Indonesia, especially in big cities like Jabodetabek, has experienced a high urban expansion. This is marked by the conversion of land into residential land and land to support economic and business activities [3].

Wildlife life that existed before humans turned it into urban areas disrupted wildlife life so that biodiversity could decline along with massive urbanization [4] [5]. It is undeniable that land conversion causes human life and wildlife to intersect and intersect. This must be handled properly, therefore in order for a good interaction between human life and wildlife in an urban environment, knowledge is needed to be able to understand how a habitat for wildlife is needed so as to create a harmonious relationship between humans and wildlife and this can protect biodiversity while also improving the quality of the environment in these cities [6] [7].
In a modern world where there is always an urbanization with a lifestyle that is limited by resources, learning to manage risks while maximizing the benefits of urban wildlife relationships is important. An understanding of human-wildlife interactions is required. This will reap the benefits and also understand how valuable wildlife is in the urban environment [4]. The government as an institution that makes decisions in the distribution of resources will affect how the human-wildlife interaction occurs. Apart from the government, the community as a broad social force acting on large groups of people such as culture, language and human migration patterns will also influence human-wildlife interaction, especially in urban areas that have high population density [8]. This paper aims to provide views on the importance of understanding the role of government and society in Human-Urban Wildlife interaction in Indonesia.

2. Method
To provide an overview of available research, literature reviews were carried out by selecting articles from peer-reviewed journals published in a 10 year period between 2010-2020. Search for suitable journals using keywords such as “biodiversity”, “urban wildlife”, “urban wildlife in Indonesia”, and “human-wildlife interaction in Indonesia”. Taking into account journals about urban wildlife that are still minimal in Indonesia, the search is also done by using factors that influence urban biodiversity in Indonesia, such as “Green Open Space in Indonesia”.

The main sources of literature are journal articles and full text. The main sources used for data collection were online databases including Google Scholar, IOP Science, Scopus, and SAGE online.

3. Result and Discussion

3.1 Condition of Biodiversity in Indonesia
The land area of Indonesia is known to be 187.9 million ha. Within this land area, it is recorded that as much as 137.09 million ha or 70% of the total area of the country is forest. Although the area of Indonesia is relatively small, amounting to 1.3% of the world's land area, Indonesia is known to have 17% of all species in the world. Ironically, Indonesia's deforestation rate falls into the very high category, forests are disappearing from Indonesia at a rate of around 3.8 million ha per year or 7.2 ha per minute. [9]. Biodiversity loss, especially in Indonesia, is a decrease in biodiversity in a species, ecosystem, in a certain geographical area. One of the causes of biodiversity loss is the reduced habitat for wildlife habitat [10]. Indonesia, especially in Java, is experiencing a phenomenon of land use / cover changes (LUCC) due to urbanization which is characterized by a large reduction in land area for forests as well as agricultural land (fertile rice fields) [11].

Human population growth and greater demand for resources are the main factors for land transformation which leads to loss of biodiversity. Major threat(s) / opportunities for biodiversity conservation in Indonesia, namely rampant deforestation with a high rating of 1.7% natural forest lost annually from 1990-2005, commercial logging from 2004-2007, illegal wildlife trade, around 12 oil palm production, 5% annual growth rate from 1996-2006) [12]. In addition, massive urbanization by changing the environment into an environment with a thick urban character has resulted in a reduction in habitat for wild animals and also fragmentation that makes wildlife unable to move freely and can cause conflict between humans and wildlife [25].

The land cover of cities in Indonesia with a focus on Depok City has changed a lot due to the existence of urban sprawl that has turned green land into built-up land which continues to occur as the human population increases. [13] be in the region. Animals are forced to survive on the remaining land and if it continues without any follow-up, it will result in conflicts between humans and wildlife that will harm both wildlife and urban communities. During January 2019 to May 2020 in Depok City, there were 502 cases of discovery and disturbance of wildlife, which were dominated by wasp and snake species [14]. Another example as an illustration of Indonesia's urban biodiversity is the case in Bali, Indonesia. Bali is not immune from the phenomenon of urbanization which causes overlapping between human and macaques [15].
3.2 The Role of Government for Protecting Biodiversity

The government as an institution that makes decisions in the distribution of resources will affect how the human-wildlife interaction occurs [8]. The government plays an important role in stabilizing large-scale cooperation in the management of shared resources. Without boundaries to regulate human behavior, most natural resources are vulnerable to overexploitation. Good institutions are an important element for cooperation in each community. Government programs should target capacity building in terms of institutional capacity and skills development to have a positive impact on biodiversity. Both stakeholders (e.g., non-governmental organizations and government) should have a role in capacity building; these roles should complement each other to ensure that the necessary resources are mobilized and that all communities receive the necessary training [16].

The identification of the frequent mismatch between an institution and the biophysical system explains the lack or loss of resilience in institutional arrangements. The types of problems that often have a mismatch between the dynamics of ecosystems and government systems cover the spatial domain, such as when the institutional jurisdiction is too large or too small to manage the ecosystem area; temporal that is when institutions are formed too early or too late for the desired ecosystem effects; threshold behavior that is when the institution is unable to prevent or avoid sudden changes in the biophysical system; the aftereffect when the institution is unable to withstand or increasingly creates further effects on the biophysical and/or social and economic systems [17].

An example that can be taken is about the Urban Green Open Spaces in Depok City, Indonesia. Urban Green Open Spaces is a place that can be used as a means of conservation for biodiversity in urban environments. Depok City Spatial Plan for 2012-2032 refers to regulations made by the central government, namely Law Number 26 of 2007 and Public Works Regulation Number 05 of 2008 concerning Spatial Planning, which requires the provision of green open space at least 30% green open space, provided that 20% is for public and 10% for private. However, in fact the amount of green open space for Depok City until 2011 was only around 3,110.88 hectares or only around 15.53% of the total area of Depok City with an area of 20,029 hectares. Whereas there is inconsistency of the government in implementing spatial planning policies with visible gaps between the policies stated in laws and regional regulations and the execution of their implementation. This is due to several factors, first, urban development planning only focuses on infrastructure development for commercial cities, the second factor is problems in the implementation made by the city government, the third factor is budgetary constraints where ownership of green land is not from the elements of society but belongs to personal that is not managed properly [18].

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3.3 The Role of Society for Protecting Biodiversity

Society plays an important role in maintaining biodiversity. Society as a broad social force acting on large groups of people such as culture, language and human migration patterns will also influence human-wildlife interaction, especially in urban areas that have high population density [8]. Urban communities are people that have high biodiversity due to the large number of population movements to urban areas [19]. Knowledge, perception, and society's attitude towards wild animals will greatly influence the existence of these wild animals. Conflict, coexistence and tolerance are context-laden and vary between human-wildlife interactions. The meaning can vary depending on socio-cultural background, type of conservation law enforcement, economic benefits, and other aspects of communities living with wildlife. These concepts do not lock into fixed points along the continuum [20].

Local people's perceptions also play an important role in city management. This should form the basis for any environmental study or urban planning especially when dealing with cities. Because doing so will help identify species preferred by populations for better implications for management but also identify practices that can hinder biodiversity conservation and population well-being in urban areas. There is a need for environmental sensitivity in order to raise awareness of urban wildlife, livestock, and also waste management in the two cities especially in the face of a growing population [21].
Environmental knowledge has a moderate relationship with environmental attitudes. Increasing the curriculum in education that includes environmental sustainability will improve attitudes and behavior of the environment itself. People who have lost their affinity for nature and are uninformed about environmental issues are unlikely to care about the local environment or be involved in solving environmental management problems. This is unfortunate because citizen involvement can enhance decision making and motivate long-term commitment to environmental management. It has been argued that “people care what they know” and that people must understand the value in nature for conservation efforts to be successful [22].

Active community participation in managing wildlife is also influenced by pro-environmental behavior. The quality of the environment is highly dependent on the level of knowledge, attitudes, values and practices of the individual. This study found that environmental knowledge has a significant impact on pro-environmental behavior [23]. People who are aware and care about the environment will play an active role in protecting and managing the wildlife in their environment, this applies to both rural and urban areas. On the other hand, people can pose a threat to wildlife, especially in urban areas if they lack awareness of the importance of protecting the environment, which indirectly also maintains and conserves biodiversity so that it does not experience a decline in population numbers and even reach extinction.

For example, the rehabilitation carried out by the Muara Angke Mangrove Community (KOMMA) and PT. Pembangkit Jawa Bali-Unit Pembangkitan (PT. PJB-UP) Muara Karang which was carried out in 2010. The location that used to be an area for garbage disposal has turned into a mangrove conservation area with the number of mangroves reaching 37,000 seedlings [24]. What has been said is a good example of how the community can participate and actively participate in managing biodiversity in their environment by rehabilitating damaged areas to become a complete ecosystem. The next example is to be able to strengthen the statement that society also plays an important role in preserving biodiversity, namely by the presence of human activities in the form of habitat destruction, illegal hunting, and also a lack of public awareness of the importance of preserving nature and the environment which increases the level of destructiveness in the environment itself. [26].

The various examples that have been described previously indicate the importance of the role of society in the sustainability of wildlife. Human activity is one of the determinants of the number of populations that exist in wildlife. The need for public awareness to participate in protecting and conserving wild animals based on educational provision regarding the importance of preserving nature and the biodiversity in it, which will be the key in community active participation in fighting to protect the environment itself.

4. Conclusion
Indonesia is endowed with a high abundance of biodiversity, but the status of extinction continues to increase. The role of stakeholders plays an important role in maintaining the existence of wildlife. The government as an institution that makes decisions in the distribution of resources will affect how the human-wildlife interaction occurs. The government plays an important role in stabilizing large-scale cooperation in the management of shared resources. Without boundaries to regulate human behavior, most natural resources are vulnerable to overexploitation. Society plays an important role in maintaining biodiversity. Society as a broad social force acting on large groups of people such as culture, language and human migration patterns will also influence human-wildlife interaction, especially in urban areas that have high population density. However, what happened in Indonesia has resulted in a decrease in the number of wildlife life and has a further impact on the continuing extinction in Indonesia due to various factors such as land conversion, ignorance and lack of knowledge about urban wildlife, likewise the influence of economic and political factors in regulation that are issues in urban wildlife in Indonesia. If this is not followed up seriously, it will have fatal consequences for biodiversity in Indonesia. The dimensions are likely to be the main drivers of urban area management, and they need to be properly implemented and integrated in all phases of management. Stopping, thinking, and educating are the main
mottos to think about when dealing with any type of human-wildlife interaction. The importance of attitudes and perceptions in shaping the outcome of human-wildlife interactions must be an important consideration in decision making. Education to promote more informed attitudes about interventions is likely to have important benefits for wildlife management and coexistence with wildlife.

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