Preface

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Towards a New Era of Natural Resources and Environmental Management

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Indonesia is ranked the fourth most populated country globally after China, India, and the United States, with an estimated population of 270.2 million [1]. It covers an area of 5,193,250 km² [2], consisting of 1,919,440 km² dry land, while 3,273,810 km² of waters with a total of 16,056 islands [2][3]. The presence of many islands covering a larger area has enabled the country to be ranked the sixth in the world with mega-biodiversity after Sweden, Norway, Finland, Canada, and the United States [4].

Overexploitation of the natural resources leads to imbalances in the ecosystem, resulting in food insecurity and climate change. The ever-increasing population has led to complex environmental dynamics causing adverse effects on natural resources. The complexity of the problem has been made worse by the diversity of the ecosystem, which prompts human activities to exploit the reserves.

The high economic growth in the last two decades has also negatively impacted the environmental quality and led to the depletion of natural resources. This has been reflected in the reckless exploitation of the available resources and the high level of environmental pollution, threatening ecological life. Furthermore, increased incidences of natural disasters such as earthquakes, tsunamis, and volcanic eruptions influenced by global climate change, cycles of tectonic and volcanic activities have been witnessed to destroy the ecosystem.

To mitigate the challenges encountered in managing natural resources, various frameworks have been adopted and implemented in various parts of the world. Research and seminars have been conducted concerning ecological balance, and results published in various journals in efforts to reduce the natural exploitation of resources. For instance, in an international seminar, it is impossible to scrutinize all environmental matters in a forum to derive the focus of the topic and come up with long-term solutions to the problem. Therefore, in such forums the major discussion topics should include Environmental Change and Disaster Management, Environmental Policy and Diplomacy, Environmental Management System, and Geo-spatial and Environmental Planning.

Environmental Change and Disaster Management involves the magnitude of natural exploitation and its impact on the environment in tropical countries, especially Indonesia. It is a change or disturbance most often caused by human activities that are influenced by the...
natural ecological processes. Indonesia is one of the countries exposed to natural exploitation, and according to The World Risk Index 2019, it was ranked 37 out of 180 most disaster-prone countries. As of May 18, 2020, 1,296 disaster events were recorded, including 331 educational facilities, 396 worship facilities, 32 health facilities, 58 offices, and 181 bridges. This occurrence was influenced by the three volcanically active tectonic plates comprising Eurasia, Indo-Australia, and the Pacific, known as the Pacific ring of fire [5]. This condition later became the cause of earthquakes, tsunamis, and volcanic eruptions. Furthermore, hydroclimatologically is also affected by the ENSO (El-Nino Southern Oscillation) and La Nina phenomena which influence the occurrence of floods, landslides, droughts, and tornadoes [6] [7] [8].

The drafting and implementation of the Environmental policy and diplomacy have become an important part of environmental management, both at the regional [9] and international levels. In recent decades, diplomats around the world have been intensively negotiating global agreements concerning environmental issues. Furthermore, City-to-city negotiations in countries such as New York, Geneva, Vienna, Montreal, Basel, and Nairobi indicate increasing environmental diplomacy. Several international negotiations have led to the development of both hard and soft laws aimed at governing natural resources.

The culmination of crucial environmental diplomacy activities at the end of this century was the organization of the Earth Summit, which took place in the city of Rio de Janeiro, Brazil, in June 1992. It formed the largest number of attendees in history and as a continuation of the 1972 United Nations Conference on the Human Environment, held in Stockholm in 1972, the 1992 Rio Summit aimed to produce several global agreements in facing the 21st century. Convention on Biological Diversity, Convention on Climate Change, Rio Declaration, Agenda 21, and Principles of Forestry are among the results achieved from environmental diplomacy. This led to the establishment of the UNCCD and others, which are inseparable from the history of environmental diplomacy and have recorded significant developments in the environmental field to date.

An environmental management system (EMS) is critical for planning, scheduling, implementing, and improving environmental performance [10]. Currently, regulations related to the environment are intensively enforced, thus affecting various organizations and companies. For instance, waste from manufacturing companies must be disposed of considering the impact it will cause on the environment. Many organizations have been reported to have benefited from the application, especially in analyzing Quantitative and qualitative data related to the ecosystem. The benefits include reducing environmental pollution, increasing process efficiency, improving management performance/work morale, increasing customer satisfaction, increasing compliance with environmental regulations, and increasing sales.

The company's environmental management system can be structured based on a certified management system, for example, through ISO certification [11] [12]. Basically, the effectiveness of certification is highly dependent on the institution that certifies, the quality
of the audit accompanying the certification, and the universality of the certification system itself [13].

Geospatial and environmental planning are also key aspects since proper planning leads to the effective implementation of environmental management systems. Currently, Law number 4 of 2011 concerning geospatial information is in practice in various organizations. The law explains that Geospatial or terrestrial space shows the location and position of an object or event below, on, or above the earth's surface. Therefore, geospatial information is mandatory to manage, especially due to the increasing population in the country. It is noted that 90% of government activities have geospatial elements hence its strategic role for development. For instance, it is used in border areas, disadvantaged places, village development, disaster mitigation, and adaptation, including macro and micro environmental aspects. The availability of accurate and reliable geospatial information leads to improved decision-making to be more efficient, effective, and communicative. This can be useful for environmental planning and management, social analysis, housing, and site selection. There are several examples of geospatial data, including coastlines, hypsography of waters, names of the earth's appearance, boundaries, transportation, public facilities, and land cover. The geospatial data aims to reduce disparities between regions, accelerate people's prosperity, and improve national defense and security.

The Covid-19 pandemic has more or less improved the quality of the environment by reducing emissions and air pollution. However, it has negatively affected various aspects of life. For instance, it has led to increased plastic and medical waste, which interfere with the ecosystem when not stored. The Indonesian Institute of Sciences said domestic plastic waste increased from 1-5 to 5-10 grams per day per individual due to the Covid-19 pandemic. In addition, the Ministry of Environment and Forestry noted an increase in the current production of medical waste by 290 tons per day [14]. Apart from the COVID-19 pandemic, many recent events have negatively impacted the environment. Events such as disasters, extreme climatic conditions, and pollution have resulted in changes in the ecosystem. Unfortunately, some of them remain the actual issues of environmental management in Indonesia and internationally. The ongoing research regarding these challenges is expected to provide long-term solutions for better management of the environment in the future, as we anticipate welcoming a new era of natural resources and environmental management.

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