Chapter 15
Radiological Detector Aircraft for Marine Life's Sustainability in Supporting Sustainable Development Goals (SDGs)

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ABSTRACT

Sustainable development goals (SDGs) aim to protect oceans by ensuring their sustainable use. This includes safeguarding marine and coastal habitats, reducing marine pollution, and minimising ocean acidification. This chapter seeks to promote the implementation of SDGs by evaluating the capability of Indonesia's marine patrols, as the world maritime axis, to address the issues presented by the use of nuclear energy as an alternative source of energy for maritime patrol. Data was gathered using the qualitative method from nuclear specialists and maritime patrol officers. After data collection reached saturation, data were codified and analysed. The Ishikawa Model is also deployed to portray stakeholder analysis structure. The research revealed the significance of Indonesia's ability to identify nuclear material as a part of the world maritime axis. The risk of failure or leakage in the water is a challenge of marine life's resilience. The research is expected to contribute to the body of knowledge by addressing how nuclear energy can be used to enhance maritime patrol capabilities.

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1. INTRODUCTION

The world is rapidly becoming a global community due to the increasing daily energy needs of all populations. In order to satisfy human social and economic development, like welfare and healthcare, the need for energy consumption is increasing significantly worldwide and its connected services are growing (Anshari et al., 2019). There are many studies confirming that energy consumption affects economic growth, financial development, industrialization, and urbanization in the global context (Anshari, 2020). In fact, energy consumption exhibits long-term bidirectional causal relationships with financial development as well as industrialization (Shahbaz & Lean, 2012; Anshari et al., 2020). The statistic shows that the world's total energy supply from 1990 to 2018 grew by 65.6% and reached 594 EJ. Asia was the main reason for this growth; Asia was responsible for 82.1% of the world's growth during this time. It increased by more than four times in China alone, making up more than a fifth of the world in 2018. From 35.2% of the world in 1990 to 18.4% in 2018, Europe has lost 17.1 EJ of its share of the world. The United States' share of the world market has decreased by 6.7 percentage points, to 15.7% in 2018 since 1990. However, the country's total output has increased by 13.1 EJ during this time. In 2018, international bunkers were equal to 17.3 EJ, or 2.9% of the world's total (UN, 2021). In addition, the International Maritime Organization (IMO) has adopted key short-term measures to reduce the carbon intensity of all ships by at least 40% by 2030 (IMO, 2021).

Due to this requirement, it requires energy sources that are already available that use the majority of utilised fuels, which impacts combustion residues that affect global temperatures. As global temperatures continue to increase, there are significant consequences for human health and wellbeing, as well as for the land, air, and water that sustain people (Anshari et al., 2022; Samiha et al., 2021). Carbon dioxide and other greenhouse gases (GHG) are emitted when fossil fuels are burned. The presence of these gases in the atmosphere contributes to global warming. Excess heat on land, in the ocean, and in the atmosphere exacerbates extreme weather (Energyfactsaustralia, 2018). The use of energy also includes transportation, which is utilized to support the expansion of the world's economy in line with its development. Water transportation contributes to around 3% of worldwide greenhouse gas emissions. If nothing is done to prevent it, it is expected that the amount of greenhouse gas emissions caused by shipping would increase by 2050 to a level that is twice as high as it is today (SIA, 2018). If this is not dealt with in a prompt and comprehensive manner by lowering emissions of greenhouse gases, then additional negative and potentially cataclysmic impacts will be inflicted upon humanity.

The use of fossil fuels to generate electricity is one of the primary contributors to climate change. Switching to renewable energy sources is one of the most effective ways to reduce this type of pollution. Recent national policies, strategies, and development plans of many countries have placed sustainable development at the center (Anshari & Almunawar, 2022). At the United Nations headquarters in New York, the Open Working Group presented a proposal to the United Nations General Assembly for a set of global SDGs. These SDGs included 169 targets and 17 goals. In addition, a preliminary set of 330 indicators was presented in March 2015 after being developed. In comparison to the Millennium Development Goals (MDGs), the SDGs place a higher priority and higher standard on the research community (Anshari et al., 2021). In order to address climate change, the provision of renewable energy, food, health care, and water requires coordinated worldwide monitoring and modelling of numerous elements that are directed socially, economically, and environmentally (Abbott et al., 2022).

Nuclear energy is an alternative energy source that is becoming more popular at the moment (Rhodes, 2020). There is the possibility of utilising nuclear power as a transportation energy source, particularly

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