Possibility of AI-based collection and policy evaluation of waste plastic policies around the world

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1. Introduction

Global concern about the problem of marine plastics has increased, and countries around the world have introduced restrictions on the use of single-use plastics and measures against plastic waste. According to the UNEP, 64 countries introduced restrictions in 2017 [1], and three years later, at the beginning of 2020, this number had increased to 132 countries [2]. However, with the rapid increase in food delivery services due to lifestyle changes caused by COVID 19, the amount of plastic waste has also increased. Regulations continue to be strengthened or postponed in many countries, and daily updates are necessary to keep up.

2. Methods

In this study, we used artificial intelligence (AI) to improve methods for collecting information on policies regarding plastic waste worldwide. In addition, the policy information we obtained was classified into the "policy measure axis," "product axis," and "numerical target axis (for the extraction of countries and institutions)" for the purpose of investigating the relationship between policy targets and progression towards the numerical targets. Furthermore, their policy measures were categorized into market-based, regulatory and voluntary approaches referring to OECD (2021).

The analysis was conducted using RuleWatcher, an information platform provided by OSINTech that allows for text analysis targeting only public information sources, such as governments and international organizations. We jointly reviewed the collection of information from the government and international organizations of each country, as well as the keywords to be targeted.

3. Results

The results showed that from April 1, 2021 to December 31, 2021, the number of information sources increased from 428 to 595, and the number of articles related to microplastics increased from 5,537 to 7,924.

The customization of tags for "micro plastic" analysis (implemented in September) showed a remarkable increase from 16 to 42 (357 definitions).

4. Conclusions and Future Implications

A previous study analyzed government documents that provided policies for dealing with plastic pollution since 2000. This was conducted using a collection of 370 policy documents [4]. By processing the data using AI technology, this collection can also be used as an advanced research infrastructure. The evolution of translation technology and artificial intelligence might allow vast information and language barriers to be crossed, increase the efficiency of information processing, and enable researchers to devote more time to research activities.

In this report, we categorize policy information into the "policy measure axis," "product axis," and "numerical target axis" (for extracting countries and institutions) in order to analyze whether restrictions on the use of single-use plastics and measures against plastic waste around the world are based on scientific evidence and whether there are numerical targets in place, such as baselines. The results of the analysis are reported in detail. Finally, we discuss the need for interdisciplinary research on marine plastics as an integrated science.

5. References

[1]United Nations Environment Programme (2018), “SINGLE-USE PLASTICS: A ROADMAP FOR SUSTAINABILITY”
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