



# Research on Problems and Countermeasures of Translating Texts for the Popularization of Environmental Science from the Perspective of Eco-translatology

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**How to cite this paper:** Jiani Li. (2024). Research on Problems and Countermeasures of Translating Texts for the Popularization of Environmental Science from the Perspective of Eco-translatology. *The Educational Review, USA*, 8(12), 1502-1505. DOI: 10.26855/er.2024.12.014

**Received:** November 16, 2024

**Accepted:** December 13, 2024

**Published:** January 10, 2025

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## Abstract

Environmental science popularization texts require concise language, precise wording, and rigorous expression. However, differences in linguistic habits and cultural backgrounds often lead to translations that fail to meet readers' needs. eco-translatology, first proposed by Chinese scholar Professor Hu Gengshen in 2001, adopts an ecological perspective to address translation challenges and advance translation techniques. It offers valuable theoretical guidance for translating environmental science popularization texts. Currently, common issues in such translations in China include unclear expressions, redundancy, and improper use of technical terms. This paper analyzes eco-translatology and environmental science popularization texts, identifies key translation problems, and emphasizes the importance of standardizing translation steps and selecting appropriate methods. By achieving adaptive transformation across linguistic, cultural, and communicative dimensions, the quality of these translations can be enhanced. This study seeks to meet the demands of diverse cultural and linguistic contexts, raise public environmental awareness, and promote cultural dissemination and environmental protection while advancing translation practices in China.

## Keywords

Eco-translatology; environment; environmental science popularization texts; translation

## 1. Introduction

With increasing attention to ecological issues, environmental science has emerged as a new discipline. Given its extensive use of technical terms and close relevance to daily life, promoting environmental science through science popularization has become an important approach. In translating environmental popularization science texts, selecting appropriate methods not only enhances reader engagement but also accurately conveys the original text's core ideas and emotions. As a theory of adaptive selection rooted in Darwin's theory of evolution, eco-translatology provides a sound theoretical foundation for translating environmental popularization science texts.

## 2. Overview of eco-translatology and popularization of environmental science

### 2.1 Introduction to eco-translatology

Eco-translatology, proposed and developed by Professor Hu Gengshen between 2001 and 2004, is a translation theory

rooted in Darwin's principles of biological evolution, emphasizing "adaptation" and "selection" in translation. It views translation as an evolving process, where translators adjust to different environments by selecting strategies suited to the context. Successful translations depend on their alignment with the translation eco-environment. At its core, eco-translatology examines the relationship between translators, the translation eco-environment, and the translation process. It compares the translation ecosystem to a natural ecosystem, focusing on the interaction between translators and their environment while exploring their adaptability and development in various contexts. Methodologically, it emphasizes adaptive selection and transformation across linguistic, cultural, and communicative dimensions (Li, Z., 2020).

## **2.2 Description of texts for the popularization of environmental science**

The environment is a vital foundation for human survival, encompassing various direct and indirect factors and conditions that influence life and development. Environmental science focuses not only on studying the environment itself but also on exploring ways for humans to coexist harmoniously with nature. As the impact of social and economic development on the environment becomes increasingly evident, people have come to realize the importance of ecological protection and sustainable development, striving to achieve a balance between humanity and nature while advancing societal progress. As a unique literary form, texts for the popularization of science have evolved alongside technological advancements. Environmental science popularization texts use accessible language to introduce knowledge about the natural environment to the general public. Compared to professional academic papers, they are more engaging to ordinary readers and have lower barriers to understanding, thereby effectively promoting environmental awareness and scientific knowledge.

## **3. Problems in translating texts for the popularization of environmental science from the perspective of eco-translatology**

### **3.1 Improper translation of technical terms**

Environmental science popularization texts emphasize lively, engaging language to create a relaxed reading atmosphere, yet they differ significantly from general novels. These texts are more rigorous, rich in technical terms, concise in grammar, and standardized in word choice, requiring careful handling of technical terms during translation. However, a common issue in translating such texts, from the perspective of eco-translatology, is the improper handling of technical terms. Some translators, lacking expertise, rely on literal translation, creating reading barriers. For instance, directly translating the "Tyndall effect" makes it overly academic, requiring readers without a scientific background to look it up. Errors in technical term translation are also frequent—most translators are not domain experts, leading to misinterpretations, while the abundance of technical terms increases the risk of fundamental errors due to minor negligence. These issues significantly undermine the accuracy and readability of translations (Mo, J., 2024).

### **3.2 Evident redundancy issues**

Environmental science popularization articles prioritize concise and clear content to provide an enjoyable reading experience. However, cultural and linguistic differences often lead to redundancy in translation, impacting quality and disrupting reading flow, ultimately causing readers to lose interest. Two main factors contribute to this issue. First, differences in linguistic habits between Chinese and English. Chinese tends to be more concise, but many translators rely on word-for-word translation, resulting in verbose content filled with colloquial expressions or excessive technical terms. Second, the handling of noun modifiers. English frequently uses multiple modifiers for nouns, which, if directly translated, can create reading barriers in Chinese. Translators should adapt to Chinese linguistic norms, simplifying modifiers to improve clarity and readability.

### **3.3 Inaccurate translation of word meanings**

Environmental science popularization texts often feature numerous technical terms and variations in word meanings that depend heavily on context. Translators must adapt their work to the specific nature and context of the text. From the perspective of eco-translatology, three key challenges arise in translating such texts. First, technical terms frequently lack standard translations, leading to misunderstandings and inaccuracies. Second, polysemy in both English and Chinese, where a single word has multiple meanings, often results in translators relying on familiar interpretations. In precise scientific texts, this can cause significant shifts in sentences and overall meaning. Third, cultural differences further complicate word interpretation, especially in texts with cultural significance, making English-to-Chinese translation

particularly challenging. These issues demand higher accuracy and adaptability in translating environmental science popularization texts (Peng, X., 2023).

## **4. Countermeasures for translation of environmental science popularization texts from the perspective of eco-translatology**

### **4.1 Adaptive transformation in the linguistic dimension**

Eco-translatology emphasizes that adaptive selection in the linguistic dimension requires adjustments in vocabulary, text structure, and expression to achieve a natural transition between different language habits. English and Chinese differ significantly in their thinking patterns and expression styles. Therefore, translators should follow the principles of Eco-Translatology to ensure that the translated text meets the needs of the target audience. For example, English often uses nouns to express actions, while Chinese tends to convey meaning through verbs. Translators should pay attention to the transition between static and dynamic expressions to make the translation more consistent with Chinese habits. For instance, in translating the sentence “Large consumers and major emitters significantly affect global sustainability”, directly interpreting “consumer” and “emitter” as “*xiao fei zhe*” and “*pai fang zhe*” does not align with Chinese linguistic norms. Instead, rendering them as “*xiao hao*” and “*pai fang*” better reflects the characteristics and reading habits of the Chinese language.

### **4.2 Adaptive transformation in the cultural dimension**

According to eco-translatology, adaptive transformation in the cultural dimension requires translators to accurately convey the cultural ideas of the source language while addressing cultural differences that may hinder understanding and communication. Translators must balance the disparities between source and target cultures. In environmental science popularization texts, foreign naturalists or botanists are often mentioned. However, many readers lack the cultural and historical background to understand these figures, leading to cultural gaps and increased reading difficulty. To resolve this, translators should not only accurately translate technical terms but also provide brief introductions to relevant experts and scholars. This approach helps readers build necessary context, reduces cultural barriers, enhances interest and comprehension, and improves the overall accessibility and appreciation of the text.

### **4.3 Adaptive transformation in the communicative dimension**

From the perspective of eco-translatology, translating environmental science popularization texts requires not only conveying the original meaning but also capturing the author’s stance and emotions. These texts aim to raise public awareness about environmental protection and promote harmony between humans and nature. Therefore, translations should evoke emotional resonance and inspire a sense of responsibility in readers. For example, in translating the sentence “The shift to clean energy will not happen unless it can be more easily stored. It is time for a high-voltage jolt to help an essential technology thrive.”, the phrase “a high-voltage jolt”, which literally translates to “*gao ya zhen dong*”, is more effectively rendered as “*gao ya zhen dang*” to better convey a sense of urgency and align with the original text’s emotional tone.

### **4.4 Standardizing translation procedures**

Translating environmental science popularization texts often involves lengthy content, requiring adherence to eco-translatology principles for efficiency and quality. Translators should focus on core content, adapting the translation with appropriate additions or reductions to suit Chinese language habits. Ensuring word accuracy through clear grammar, meanings, and logical relationships is essential to avoid misinterpretations. Complex sentence structures, such as post-modifiers, inserted elements, and polysemy, should be carefully handled. Lastly, translations should be polished to align with Chinese expression and structure, enhancing accessibility for readers. Following these steps can greatly improve the quality and readability of such texts.

### **4.5 Choosing appropriate translation methods**

There are various translation methods, and translators should master and flexibly apply them during the translation process, selecting the most appropriate method based on the characteristics of the text. Common translation methods include transposition, sequential translation, substitution, addition, and omission. In translating science popularization texts, a single method is often insufficient, requiring a combination of approaches based on the context. Word-for-word translation is the most commonly used method, but to ensure the text flows smoothly and suits Chinese reading habits, addition and

omission methods are often employed. Guided by the principles of eco-translatology, selecting suitable translation methods for environmental science popularization texts can significantly enhance their accuracy and readability (Zhao, Y., 2023).

## 5. Conclusion

From the perspective of eco-translatology, the translation of environmental science popularization texts should integrate insights from multiple disciplines to enhance its guiding role. As these texts gain broader recognition among the public, translators should adopt appropriate methods, standardize translation procedures, and prioritize simplicity, scientific accuracy, rigor, and professionalism. By continually improving the quality of translations, they can meet the public's demand for environmental knowledge and contribute to the harmonious development of humans and nature.

## Funding

This research is funded by the horizontal scientific research projects of Yulin University (Project No. H2024060088 and Project No. H2024060137).

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