CHALLENGES IN ACHIEVING LEXICAL AND SEMANTIC EQUIVALENCE IN THE TRANSLATION OF ENGLISH ENVIRONMENTAL TERMS INTO RUSSIAN

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ABSTRACT

Currently, environmental pollution and the search for effective solutions represent one of the most important focuses in modern scientific research. Successfully addressing these environmental challenges requires access to precise and specialized information, much of which is available primarily in English. This study examines the primary difficulties encountered when translating English environmental terminology into Russian. It explores the fields where these terms are used and identifies criteria that guarantee the accuracy and adequacy of their translation.

Keywords: environmental terminology, translation, adequacy, environment, eco-translation.

Ecology as a scientific field began to take shape over a century ago. The term "ecology" was introduced in 1866 by the German naturalist Ernst Haeckel. It originates from the ancient Greek words: "oikos" meaning house or dwelling, and "logos" meaning study or science. Broadly speaking, ecology is the study of living organisms (including humans), their interactions with one another, and with their environment, as well as the processes that sustain the "natural home."

Today, ecology continues to evolve, constantly enriched by new scientific knowledge. This development brings with it specialized vocabulary that may be unfamiliar to native speakers of other languages. In an era of globalization, addressing environmental challenges demands international collaboration and effective information exchange. Consequently, this creates a growing need for high-quality intercultural communication and precise translation of environmental materials. The scientific explanation of emerging technologies and concepts necessitates the use of specialized terminology, which in turn requires accurate translation into different languages.

Terminology plays a crucial role in conveying information within environmental texts. Since these texts deal with specialized fields of knowledge, the use of precise terms is essential to ensure both accuracy and clarity in communication. As a scientific discipline, is deeply interconnected with various other sciences and frequently adopts terminology from them. For instance, environmental vocabulary includes terms borrowed from biology such as *biocenosis, aerobes,* and *biomass*; from chemistry — *radionuclides, dioxins,* and *aerosols*; from geography — *areal*

and *landscape*; from physics — *absorption* and *water cycle*; and from geology — *albedo, soil degradation*, and *erosion*. Both English and Russian environmental terminologies are primarily rooted in Greek and Latin linguistic traditions.

Terminological units can be categorized based on various criteria. This study focuses primarily on the structural classification of terms, as their structure often presents challenges during translation from English. In English, terms are generally classified into simple, compound, and phraseological terms.

Simple terms consist of a single word that denotes a specific concept, such as *bird*, *flora*, or *sea*. Compound terms, on the other hand, are formed by combining two or more words into a single lexical unit, for example: *riverside* (from river + side), *overfall* (from over + fall), and *jellyfish* (from jelly + fish).

Phraseological terms are typically divided into three categories. The first category consists of combinations formed by two specialized terms, each of which can be used independently while retaining its meaning. For instance, the words *plant* and *association* individually denote *a plant* and *a community*, but together as *plant association*, they form a new term describing a specific plant community.

The second category includes phrases where the first word is scientific terminology, while the second word is either a general language term or one used across multiple scientific fields. For example, term *geological age* combines the specialized adjective *geological* with the common noun *age*. Similarly, *alternative energy* pairs the scientific adjective *alternative* with *energy*, which appears in different scientific contexts such as physics (potential energy), chemistry (nuclear energy), and geology (geothermal energy).

The third category is made up of terms consisting of two common words that only acquire a specialized meaning when combined. Examples include *green belt* (an area of green space) and *food chain* (a sequence of organisms in an ecosystem).

When translating from English to Russian, various challenges may arise due to both the peculiarities of sentence syntax and incorrect interpretation of lexical units. The primary goal of the translator is to produce a text that closely matches the original in both meaning and style. However, conveying subtle semantic and lexical nuances can be difficult because of differences between the language systems.

A major source of difficulty is the polysemy of terms. Many English words have several Russian equivalents with meanings that can differ significantly. For instance, the English word *soil* can be translated as «почва», «земля», «грязь», or even «страна», and can also function as a verb meaning "загрязнять." Likewise, the Russian word «почва» may be translated into English as *soil*, *ground*, *earth*, etc., depending on the context. Thus, the accuracy of translating such polysemous terms heavily relies on the surrounding context.

Additional challenges arise from so-called "false friends" — words that look similar to Russian words but have different meanings. In ecological texts, terms like *producers, consumers*, and *decomposers* often appear, and literal translations may lead to incorrect interpretations. Although producers and consumers could be translated as «производители» and «потребители», the established specialized terms in environmental science are *«продуценты»* and *«консументы»*. For *decomposers*, a mistaken calque such as *«декомпозиты»* might occur, but the correct equivalent used in Russian scientific literature is *«редуценты»*.

The primary goal when translating from Russian is to convey the meaning rather than translate word-for-word. Selecting semantically adequate equivalents is crucial for high-quality translation, rather than merely choosing dictionary matches.

The greatest difficulties in translating environmental terminology are often associated with phraseological terms (term-compounds). To achieve an accurate translation, it is essential first to identify the main word (the term's core) and understand the logical-semantic relationship among all parts of the phrase. In translation practice, the following principal methods are commonly used for rendering complex terms:

<u>Descriptive method</u> is applied when there is no exact equivalent in the target language. For example, *diatomist* is translated as "a scientist who studies diatom algae."

<u>Calquing</u> involves a literal translation of the term's components while preserving its original structure: Radioactive Waste — радиоактивные отходы, Biodegradability — биологическая деградация, Biosphere Reserve — биосферный заповедник.

<u>Using the genitive case</u> is a common way to express phrase structure in Russian: Pollution Source — источник загрязнения, Natural Resources Conservation сохранение природных ресурсов, River Flow — течение реки.

<u>Transfer with prepositions</u> is applied when a more flexible syntactic connection is required: *Air Emissions Permit — разрешение на выбросы в атмосферу, Surface Oil Slick — нефтяная пленка на поверхности воды.*

<u>Inversion</u> - a change in the order of words during translation: *carbon dioxide* — *двуокись углерода, catchment area* — *площадь водосбора, sewage treatment* — *очистка сточных вод*.

<u>Adding clarifying vocabulary</u> is used to increase the clarity of translation: visual pollution — визуальное загрязнение окружающей среды, disposal area — участок удаления отходов.

Specialization - it is important when translating words that have close meanings, but various conceptual foundations. For example, the words *Ecology* and *Environmentalism* are often mistakenly translated the same - as "экология". However, there is a fundamental difference between them. *Ecology* is a scientific discipline that studies living organisms and their interaction with the environment, while *Environmentalism* is a social movement focused on protecting and improving the state of the environment. Thus, these terms are not interchangeable and require accurate distinction during translation.

In conclusion, a term is a specific lexical unit whose translation requires the use of various translational transformations. The choice of translation method primarily depends on the structure of the term itself. Therefore, the issue of translating environmental terminology remains relevant today and is likely to retain its importance in the future. This is because environmental terminology, as a branch of scientific language, is still developing, actively borrowing terms from related sciences while simultaneously creating new concepts to describe modern environmental realities and phenomena.

With the continued advancement of science and technology, new concepts and terms are expected to emerge, demanding from translators not only a high proficiency in English but also a deep understanding of environmental subjects. It is also crucial to consider the polysemy of words and to avoid false semantic equivalents with the native language.

For effective and accurate translation of environmental texts, the following basic principles should be observed:

1. If there is an appropriate term in the target language, use the substitution method.

- 2. In the absence of an equivalent, apply descriptive translation.
- 3. For international terminology, use calque translation.

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