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## **CHALLENGES AND SOLUTIONS IN FORMING ECOLOGICAL TERMINOLOGY IN THE UZBEK LANGUAGE**

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### **Abstract**

The growing importance of environmental issues in Uzbekistan and worldwide has created an urgent need for a precise and accessible ecological terminology in the Uzbek language. Yet, while environmental discourse has expanded rapidly, the Uzbek lexicon has not kept pace, resulting in lexical gaps, inconsistent usage, and heavy reliance on foreign borrowings. This article draws on a qualitative review of 25 Uzbek-language environmental science textbooks, four bilingual glossaries, and 18 scientific papers published between 2020 and 2024 to identify and analyse five pressing challenges — the lack of equivalent terms, inconsistency and fragmentation, the rapid emergence of new concepts, the dominance of loanwords, and the difficulty of communicating technical terms to a broad audience. Concrete, step-by-step solutions are then proposed for each. By aligning linguistic planning with scientific accuracy and public comprehension, Uzbekistan can develop a coherent ecological lexicon suitable for education, policy, and research.

**Keywords:** ecological terminology, term formation, terminology standardization, translation of environmental terms, loanwords, localization of new concepts, two-tier terminology system.

### **Аннотация**

Возрастающая значимость экологических проблем в Узбекистане и во всём мире создала острую необходимость в точной и доступной экологической терминологии на узбекском языке. Однако, несмотря на быстрое расширение экологического дискурса, узбекская лексика не успевает за ним, что приводит к лексическим пробелам, несогласованному употреблению и сильной



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зависимости от заимствований из других языков. В данной статье на основе качественного анализа 25 узбекоязычных учебников по экологическим наукам, четырём двуязычным глоссариев и 18 научных статей, опубликованных в 2020–2024 гг., выявляются и анализируются пять наиболее актуальных проблем: отсутствие эквивалентных терминов, несогласованность и фрагментарность, быстрый рост числа новых понятий, доминирование заимствований и трудности передачи технических терминов широкой аудитории. Для каждой проблемы предлагаются конкретные пошаговые решения. Согласование языкового планирования с научной точностью и общественной понятностью позволит Узбекистану разработать целостный экологический лексикон, пригодный для использования в образовании, политике и научных исследованиях.

**Ключевые слова:** экологическая терминология; образование терминов; стандартизация терминологии; перевод экологических терминов; заимствованные слова; локализация новых понятий; двухуровневая система терминов.

### Annotatsiya

O‘zbekistonda va butun dunyoda ekologik muammolarning ortib borayotgan ahamiyati o‘zbek tilida aniq va tushunarli ekologik terminologiyaga bo‘lgan keskin ehtiyojni yuzaga keltirdi. Biroq, ekologik diskurs tez sur‘atlar bilan kengayayotgan bo‘lsa-da, o‘zbekcha leksika unga yetarlicha hamnafas bo‘la olmayapti, natijada leksik bo‘shliqlar, nomuvofiq qo‘llanish va chet tillaridan olingan so‘zlarga kuchli tayanish yuzaga kelmoqda. Ushbu maqolada 2020–2024-yillarda chop etilgan 25 ta o‘zbekcha ekologiya darsligi, to‘rtta ikki tilli glossariy va 18 ta ilmiy maqolaga sifat jihatidan tahlil o‘tkazilib, beshta eng dolzarb muammo — ekvivalent terminlarning yo‘qligi, nomuvofiqlik va parokandalik, yangi tushunchalarning tez paydo bo‘lishi, o‘zlashtirilgan so‘zlarning ustunligi hamda texnik terminlarni keng auditoriyaga yetkazish qiyinchiliklari — aniqlanadi va tahlil qilinadi. Har bir muammo bo‘yicha aniq, bosqichma-bosqich yechimlar taklif etiladi. Lingvistik rejalashtirishni ilmiy aniqlik va jamoatchilik tushunchasi bilan uyg‘unlashtirish orqali O‘zbekiston ta’lim,



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siyosat va ilmiy tadqiqotlar uchun mos bo'lgan yaxlit ekologik leksikonga ega bo'lishi mumkin.

**Kalit so'zlar:** ekologik terminologiya; termin yaratish; terminologiyani standartlashtirish; ekologik terminlarni tarjima qilish; o'zlashtirilgan so'zlar; yangi tushunchalarni lokalizatsiya qilish; ikki pog'onali termin tizimi.

### Introduction

Environmental sciences have expanded dramatically over the past several decades, generating hundreds of new concepts and terms related to climate change, biodiversity, resource management, and sustainable development. These terms, most of which originate in English, are disseminated globally through policy documents, academic publications, and the media. In Uzbekistan, as in many non-English-speaking countries, the adoption and adaptation of this terminology is indispensable for implementing environmental reforms and educating the public. However, the process of forming Uzbek equivalents has been uneven, marked by a mixture of direct borrowings, literal translations, ad hoc coinages, and hybrid forms. This situation risks undermining scientific precision, reducing public comprehension, and ultimately weakening environmental governance. The present article therefore seeks to identify the most urgent problems in the formation of ecological terms in Uzbek and to offer practical, linguistically grounded solutions.

### Literature Review

Several researchers have highlighted the complex interplay of linguistic, cultural, and institutional factors in the development of Uzbek scientific terminology. Norqulova (2023) points to the dominance of Russian and English borrowings and the lack of standardized glossaries, while Saliyeva and Norboev (2024) show that translators often struggle to balance international scientific accuracy with national linguistic norms. Comparative work by Karimova (2022) demonstrates that other Turkic languages face similar challenges but also illustrates how coordinated national efforts, such as Turkey's production of official environmental glossaries, can successfully standardize and popularize new terms. Additional research



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(Usmonova, 2021; Tursunov, 2023) stresses that inconsistent terminology in Uzbek school textbooks hinders students' understanding of ecological concepts. This body of research suggests that while Uzbek faces significant obstacles, there is also a clear path forward if institutions coordinate their efforts and base new coinages on transparent principles.

### Methodology

This study is based on a qualitative analysis of 25 environmental science textbooks used in higher and secondary education in Uzbekistan, four bilingual glossaries (English–Uzbek and Russian–Uzbek) published between 2020 and 2024, and 18 articles from Uzbek and international journals. All instances of key ecological terms ( $n = 150$ ) were extracted and coded for (a) presence/absence of an Uzbek equivalent, (b) number of competing forms, (c) source of borrowing, and (d) level of comprehensibility based on textbook explanations. This allowed for an empirical identification of the most urgent problems and provided material for illustrating possible solutions.

**Key Problems and Evidence. 1. Lack of Uzbek equivalents.** Out of 150 key terms, 42 (28%) had no clear Uzbek equivalent and were used in English or Russian form only. For example, carbon footprint appeared as karbon futprit in one textbook, uglerod izi in another, and was left untranslated in a third.

**2. Inconsistency and fragmentation.** Among terms that do have an Uzbek rendering, 33 (22%) showed at least two competing forms. For instance, biodiversity appeared as biologik xilma-xillik, bioturfa, and xilma-xillik across different materials.

**3. Emergence of new concepts.** Concepts such as circular economy, carbon offset, and nature-based solutions have entered policy documents but were absent or inconsistently translated in textbooks, indicating a lag in localisation.



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**4. Influence of loanwords.** A majority of key terms (56%) were borrowings from Russian or English without adaptation, such as *atmosfera ifloslanishi* versus *zag'rajzneniye atmosferi*. In some cases, hybrid forms mixed Uzbek suffixes with Russian roots.

**5. Educational and public communication barriers.** Focus groups with 15 teachers and 10 journalists revealed that many newly coined terms (e.g., *uglerod neytralligi*) were unfamiliar to them, reducing their ability to explain concepts clearly to students or the public.

### Discussion

To address these challenges, a multifaceted approach is necessary. First, the establishment of a national ecological terminology committee under the Academy of Sciences or the Ministry of Higher Education would allow experts in linguistics and environmental science to coin equivalents systematically, review competing forms, and update them regularly. Such a committee could produce an official online glossary, updated annually, that provides Uzbek terms alongside English and Russian equivalents and includes recommended usage contexts. Second, standardisation guidelines should be published for educators, journalists, and civil servants, ensuring uniform usage across sectors and preventing ad hoc translation practices. Third, the creation of a “living glossary” for new concepts, hosted online and open to proposals from academics and students, would enable the rapid localisation of emerging terms such as those related to carbon markets or climate adaptation. Fourth, a selective borrowing policy is advisable: international scientific terms like *ekologiya* or *biosfera* may be retained for global consistency, while adaptable concepts should be rendered in Uzbek (e.g., carbon footprint → *uglerod izi*). This hybrid approach helps balance recognisability with linguistic authenticity. Fifth, to overcome educational and communication barriers, a two-tier terminology system can be developed, providing a concise technical term for specialists and a simplified explanation for public use. For example, alongside *uglerod neytralligi* (“carbon neutrality”), textbooks and media materials could include a plain-language gloss such as “*havoga chiqadigan uglerod gazini kamaytirish.*” Complementing this,



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capacity-building initiatives such as short courses for teachers, translators, and journalists on ecological terminology would improve both accuracy and dissemination. Finally, community engagement — involving universities, research centres, and student projects in term creation — would not only fill lexical gaps but also increase ownership and acceptance of new terms.

### Conclusion

The formation of ecological terminology in Uzbek is both a linguistic and a social challenge that requires coordinated institutional action. Without such action, inconsistency, foreign dominance, and public incomprehension will persist, undermining environmental education and policy implementation. By implementing a structured approach that combines systematic coinage, standardisation, public dissemination, and education, Uzbekistan can develop a robust ecological lexicon that serves the dual purposes of scientific precision and public understanding. This process will also strengthen the status of the Uzbek language as a medium for cutting-edge environmental discourse and support the country's broader goals of sustainable development and international integration.

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