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Ecological concepts in Modern English



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АНОТАЦІЯ

Стець Р.М. Екологічні концепти в сучасній англійській мові. – Бакалаврська робота.

Роботу присвячено дослідженню екологічних концептів у сучасній англійській мові на матеріалі екологічних звітів провідних організацій світу. Актуальність дослідження зумовлена зростанням ролі екологічного дискурсу у формуванні суспільного сприйняття екологічних проблем та мовної репрезентації взаємодії людини й довкілля. Мета дослідження – комплексний аналіз екологічних концептів, способів їх концептуалізації, фреймування та вербалізації в сучасному екологічному дискурсі. Об'єктом дослідження є актуальні екологічні концепти, предметом – їхня когнітивна структура, концептуальне моделювання та мовний компонент.

За результатами проведеного дослідження встановлено, що поняття екології у сучасному світі тлумачиться як складна взаємозалежна система, що формує ступеневу концептуальну структуру, до якої входять макроконцепти, субконцепти та мікроконцепти. Методи когнітивно-лінгвістичного аналізу сприяли виявленню переважних мовленнєвих схем і фреймових структур, які утворюють концептуальну модель екології. Виявлено, що сучасний англomовний екологічний дискурс зображує екологію через такі домінантні концепти, як криза, вплив, адаптація, пом'якшення наслідків впливу, сталий розвиток, трансформація та системність. У ході аналізу встановлено, що екологічні концепти вербалізуються через термінологію, оцінну лексику, концептуальні метафори, модальність, причинно-наслідкові та умовні конструкції. Дослідження також підтвердило, що екологічний дискурс виконує не лише інформативну, а й когнітивну, прагматичну та переконувальну функції, сприяючи формуванню екологічної відповідальності та відображенню екологічної реальності.

Ключові слова: екологія, екологічні концепти, екологічний дискурс, когнітивна лінгвістика, концептуальна метафора, фрейм, фреймування, концептуальна модель, вербалізація.

ABSTRACT

Stets R.M. Ecological concepts in Modern English. – Bachelor's thesis.

The study is dedicated to the analysis of ecological concepts in modern English based on global environmental reports. The relevance of the research is determined by the increasing role of ecological discourse in shaping public perception of environmental issues and the linguistic representation of the interaction between humans and the environment. The purpose of the research is to conduct a comprehensive analysis of ecological concepts, the ways of their conceptualization, framing, and verbalization in modern ecological discourse. The object of the research is contemporary ecological concepts, with the subject being their cognitive structure, conceptual modelling, and linguistic component.

The results of the conducted research demonstrated that the notion of ecology in the modern world is interpreted as a complex interconnected system forming a hierarchical conceptual structure that includes macroconcepts, subconcepts, and microconcepts. The methods of cognitive linguistic analysis contributed to identifying dominant discourse patterns and frames that construct the conceptual model of ecology. It was confirmed that modern English ecological discourse represents ecology through such dominant concepts as crisis, impact, adaptation, mitigation, sustainability, transformation, and systemicity. The analysis established that ecological concepts are verbalized through terminology, evaluative vocabulary, conceptual metaphors, modality, causal, and conditional constructions. The research also confirmed that ecological discourse performs not only informative, but also cognitive, pragmatic, and persuasive functions, contributing to the formation of environmental responsibility and the representation of ecological reality.

Keywords: ecology, ecological concepts, ecological discourse, cognitive linguistics, conceptual metaphor, frame, framing, conceptual model, verbalization.

INTRODUCTION

In the face of global environmental problems including climate change, pollution, ecological degradation, and environmental deterioration, the field of ecology, in addition to being the scientific discipline, has evolved into a valuable object of social, political, and linguistic inquiry. Language has become a means for ecological studies to eliminate the destructive impact on ecology through specific language forms. Thus, ecology and language come together to create unified approaches accelerating environmental solutions in the search of those forms of language that nourish the worldview, organize it around certain concepts, and prompt people to protect the environment.

The relevance of this study is determined by the significant role of ecological concepts in affecting human knowledge about ecology and the importance of their reasonable interpretation in the light of environmental issues. In this case, concepts establish bonds between language and ecology, influencing the way we think. The study of concepts as an integral part of cognitive linguistics, ecolinguistics, psychology, and sociology has been marked by the fundamental works of such scholars as G. Murphy, A. Stibbe, S. Carey, G. Lakoff, J. Fodor, S. Laurence, E. Margolis, E. Machery, D. Medin, W. Croft, R. Goldstone, and others. Significant contributions to this field were also made by Ukrainian scholars, including M. Polyuzhyn, O. Babire, I. Rozmarytsia, M. Zhulinska, N. Plotnikova, and N. Kovalyk. Their research focuses on the essence of concepts, their origins, features, structures, conceptual fields and frameworks, as well as theories of concept analysis. Furthermore, arising inconsistencies and contradictions as to what concepts truly are and what functions they perform in a discourse along with human mind were closely examined. Since our focus is on ecological concepts, the practical analysis of this paper particularly concerns the interrelationships of language, thought, and ecology.

The novelty of this study is determined by the comprehensive exploration of ecological concepts fixed in global environmental reports regarding their collective

representation, conceptual field, domain structure, linguistic realization, and conceptual modelling that systematizes knowledge of ecology.

The object of this study is ecological concepts in Modern English.

The subject of this study is framing, structure, and modelling of ecological concepts in environmental reports.

The purpose of this study is to investigate the theoretical aspect of linguistic study of ecological concepts and analyze the peculiarities of their usage in global environmental reports. The goal of the study is achieved by setting the following **objectives**:

1. to define the notion of concept and describe its main characteristics within cognitive studies;
2. to outline the principal methods of concept studies and analysis;
3. to examine the specific features of ecological discourse in modern language use;
4. to define the relations between ecolinguistics and concept studies;
5. to analyze the conceptual framing of ecology in global environmental reports;
6. to identify the components of ecological domains;
7. to distinguish linguistic means applied in concept formation;
8. to describe ecology as a conceptual model in Modern English.

The material under this study encompasses seven environmental reports published during the period from 2023 to 2025 and totaling 2487 pages. The reports were issued by European Environment Agency (EEA), Intergovernmental Panel on Climate Change (IPCC), Joint Research Centre (JRC) of the European Commission, Organization for Economic Co-operation and Development (OECD), Potsdam Institute for Climate Impact Research (PIK), United Nations Environment Programme (UNEP).

The methodological framework of the study includes the following methods: *descriptive method* is employed to outline and explain the main features of concepts and their functioning within ecolinguistics based on existing linguistic theories and

scholarly interpretations; *conceptual content analysis* is used to identify the internal structure of concepts, including its core, peripheral components, and key semantic features: specific vocabulary, themes; *cognitive linguistic analysis* is applied to examine the cognitive and linguistic mechanisms of ecological conceptualization; *discourse analysis* is employed to investigate the patterns of concept functioning in the context of ecology: *ecological, critical and positive discourse analysis*.

The theoretical value of the paper lies in the further development of cognitive linguistic approaches to the study of ecological concepts. The study broadens the understanding of how ecological concepts are structured, conceptualized, and verbalized in Modern English.

The practical value of the paper lies in its focus on contemporary ecological discourse and relevant environmental issues represented in international environmental reports. The study highlights the linguistic mechanisms through which ecological problems, risks, sustainability, and environmental transformation are communicated and interpreted in modern society, emphasizing the role of language in shaping ecological awareness and public understanding of environmental challenges.

Approbation of the thesis. The results of the conducted study were approbated at the X All-Ukrainian Scientific Readings with the participation of young scientists “ФІЛОЛОГІЯ XXI СТОЛІТТЯ: НОВІ ДОСЛІДЖЕННЯ І ПЕРСПЕКТИВИ”. (April 3, 2026, Educational and Scientific Institute of Philology) [Stets 2026, p. 43].

This paper contains an introduction, two chapters, conclusions to chapters, a general conclusion, references, and appendices. In the introduction, the object, subject, purpose, objectives, illustrative materials, methods, theoretical and practical value of the paper are demonstrated. Chapter 1 reveals the theoretical basis for studying concepts and their place within the ecological discourse. Chapter 2 is dedicated to the analysis of ecological concepts including framing, conceptual structure analysis, verbalization, and modelling techniques. Total volume of the work encompasses 75 pages, with 52 pages of the main text. List of references contains 98 items.

1. THEORETICAL FOUNDATIONS OF THE LINGUISTIC STUDY OF ECOLOGICAL CONCEPTS

1.1 The concept, its main characteristics, and methods of analysis

Concepts have been investigated from a variety of different perspectives by scholars around the world, and it remains an object of debates in the 21st century. According to Cambridge and Collins dictionaries ‘a concept’ is described as ‘a principle or idea’, whereas Merriam-Webster dictionary represents it as ‘something conceived in mind’ and ‘an abstract or generic idea generalized from particular instances’ [90]. Originally, the notion stems from Latin ‘conceptus’ (a thought, purpose, also conceiving) and the verb ‘concipiō’ (to take in, conceive) [91].

In concept studies, we can broadly observe the way cognitive scientists define the notion of concepts and their characteristics. These studies create a framework for further research and analysis. However, there is a long-standing controversy concerning the real nature of the phenomenon since conceptual representation is complex and heterogeneous. According to S. Laurence and E. Margolis, concepts are “sub-propositional mental representations” [Laurence, Margolis 1999, p. 6]. They reject the idea that concepts are simply mental representations expressed through language. At the same time, concepts are not complete thoughts or representations either. They are considered mental particulars tokened in the mind.

Referring to the conceptual structure, S. Laurence and E. Margolis suggested a pluralistic framework for its understanding. They highlighted two basic types of concepts: primitive or atomic (lacking structure), and complex (having structure), as well as two models of conceptual structure [Laurence, Margolis 1999, p. 6]. The Containment model based on categorization means concepts containing other concepts as parts. For instance, *bachelor* presupposes the concepts *man*, *adult*, *unmarried*. Whenever we token the concept *bachelor*, the concepts *man* and *unmarried* are also tokened because they are parts of the same mental representation. The concept *chair* comprises a set of attributes which must be present to classify an

object as a chair, such as a physical object, inanimate, furniture, has a seat, back, and legs. Alternatively, following the Inferential model concepts are not composed of other concepts as elements. Instead, they are connected through associative relations. For example, *red* is an associatively related concept to color. A person will naturally conclude that a thing is colored since it is red without having to consciously think of the concept of *color* under red. Therefore, the connection is in the form of inference, not structure. Similarly, the concept of *a dog* serves as an indicative symbol in the mind. The symbol is integrated into a perception network that contains concepts and beliefs. We can create cause-effect relationships without perceiving these as components to the concept of a dog. The speaker still possesses it as a concept, even though he or she may be wrong on certain features.

S. Laurence and E. Margolis also challenged G. Frege's claim that concepts are abstract objects, not mental ones [Frege 1996]. According to this idea, concepts are objective and mind-dependent, possessing the ability to be interpreted the same by different people. This assertion arose from Frege's distinction between reference and sense. He observed that different expressions can refer to the same object in the world (reference) yet present it in different ways (modes of representations). For example, Mark Twain and Samuel Clemens are the same person. Thus, he introduced sense because it is tied to collective psychology. In Frege's time, the argument was convincing. However, S. Laurence and E. Margolis could not concur that concepts are entirely objective. The distinction had to be made between mental representations. Each person has their own token, or many people can have tokens of the same type. Therefore, concepts can be both mental and objectively shareable at the level of types. In contrast, according to Ed. Zalta, who referred in his work to Frege's view, modes of representation result particularly from the idea that concepts are abstract entities, not mental images or tokens. Instead, they give content to those tokens [Zalta 2002, p. 336].

The definition and nature of concepts were further challenged by application of theories, researched ten years earlier by D. Medin with aim to determine conceptual structure [Medin 1989, p. 1470]. The Traditional Theory or Definition View is

commonly referred to as the Classical theory. It suggests that “most concepts are structured mental representations that encode a set of necessary and sufficient conditions for their application, if possible, in sensory or perceptual terms”, which employs the Containment model mentioned previously [Laurence, Margolis 1999, p. 11]. The theory is now outdated and refined, yet it dominated for centuries due to offering a single unified explanation to many important things. We can observe traces of this approach in later works, such as H. Moss’s claim that conceptual knowledge is represented as feature-based structures [Moss 2007, p. 220]. Conversely, this theory received strong criticism as most concepts do not have clear definitions. Moreover, if concepts were based on definitions, more complex ones would be hard to process, e.g. explicitly defining abstract concepts like *knowledge*.

The Prototype theory became an alternative suggesting that concepts encode what is typical. According to this view, concepts were defined as “structured mental representations that encode the properties that objects in their extension tend to possess” [Laurence, Margolis 1999, p. 28]. Categorization is modeled in the form of similarity comparison between the target concept representation and the object representation. If similarity is high enough, then membership is guaranteed, namely similarity between *fish* and *Dory*, the cartoon character. However, typicality effects may not prove that a concept has a prototype structure. We can misclassify real cases or simply struggle to find a prototype. For example, given the realities of the 21st century, early in the pandemic, many people mistook 'loss of smell' for COVID. On the contrary, some COVID instances lack it, whereas other illnesses have it. Thus, it does not define the category. J. Hampton supported the analysis of concepts as prototypes suggesting that typicality matters since some members are better examples than others. Concepts exist in different states. The same exemplar, or property, can be typical in one context and not typical in another [Hampton 2015, p. 660]. Prototypes are recognized faster, learned earlier, and remembered better, e.g. *apple* is a more typical fruit than *avocado*. Besides, J. Hampton also argued that concepts cannot be reduced to mental representations stressing the problem of error in the sense that meaning is limited by reference to real classes in the world, not by beliefs alone

[Hampton 2015, p. 661]. Another claim regarding prototypes was expressed much later by G. Del Pinal. He concluded that prototypes help build meanings, and new features appear because context activates them. Thus, concepts are considered internally structured mental representations with prototypes being compositional components [Del Pinal 2015, p. 2912].

The identity of concepts can also be determined by the role they play within mental theories, which was claimed by the Theory-theory. According to this approach, people explain the world through causal-explanatory frameworks, where concepts function as “representations whose structure consists in their relations to other concepts as specified by a mental theory” [Laurence, Margolis 1999, p. 47]. Theories represent large belief systems with concepts being constituents. The inferential model of conceptual structure is applied to show inferential relations. For example, concept *disease* does not just involve fever and pain, but rather causes, internal mechanisms, effects, and treatment. While this theory successfully accounts for conceptual development and psychological essentialism, it faces serious challenges concerning permanent relations between theories and concepts, incompleteness of theories and problem of stability in case of theory change.

The Classical theory revived in the form of the Neo-Classical theory, which keeps the claim that concepts encode necessary conditions, yet partial definitions to explain language patterns. However, it struggles to explain how concepts can avoid becoming classical definitions. Moreover, E. Machery suggested a radical conclusion that cognitive science should stop using the vague term *concept* and focus directly on prototypes, exemplars, and theories to increase precision [Machery 2010, p. 199].

All these theories share the idea of concepts having structure. Notwithstanding, the theory of conceptual atomism represents a counterclaim to this. J. Fodor promoted the belief that concepts in our mind are single pieces like atoms without smaller meaning-carriers [Fodor 1998, p. 132]. Causal links between the brain and the world explain the nature of concepts. For example, when we see a dog, it triggers the concept of a *dog* in mind without the need to connect all features that would satisfy the concept. Likewise, in his study “How to acquire a concept” E. Margolis

persisted in claiming that concepts are atomistic mental representations whose identity is grounded in mind-world relations rather than internal structure. People, especially children, can acquire them through experience with real examples, using simple cues, which connect the concept to the world [Margolis 1998, p. 368]. Nevertheless, the theory received sustained criticism, since it cannot simultaneously account for reference, compositionality, and cognitive explanations without abandoning its core claim that concepts lack structure. By considering concepts as primitive atoms, the link between conceptual content and internal organization is disintegrated. Furthermore, the atomistic view does not scale to complex concepts. According to J. Quilty-Dunn, another challenge to atomism is polysemy. He considered concepts “generative pointers, that is, unstructured symbols that point to memory locations where cognitively useful bodies of information are stored and can be deployed to resolve polysemy” [Quilty-Dunn 2020, p. 158]. In addition, R. Carston maintained that many words have multiple equally basic uses, undermining the idea that they encode stable conceptual content [Carston 2012, p. 615].

Therefore, there is no single theory of concepts to cover all functions. Ostensibly, concepts are multifaceted phenomena with no single type of conceptual structure. S. Laurence and E. Margolis tried to distinguish four types of conceptual structure: *compositional reference-determining structure*, which determines how concepts fix reference and combine with other concepts; *non-semantic structure*, which plays an essential role in categorization and defining the explanatory function of concepts helping us to recognize things immediately; *non-referential semantic structure*, where some aspects of meaning determine the content of concepts rather than reference; and *sustaining mechanism structure*, which acts like a mental support system that helps a concept function correctly in real life due to perception, memory, learning, and experience with things [Laurence, Margolis 1999, p. 76].

To summarize, S. Laurence and E. Margolis’s view is based on a pluralistic approach to concept study. N. Shea considered this study to be the one presenting core cognitive tools and suggested that any adequate theory of concepts must account for their nature and cognitive function [Shea 2024]. Additionally, G. Lakoff and M.

Johnson believed that our conceptual system is fundamentally metaphorical, meaning that a network of expressions reflects the same underlying conceptual mapping [Lakoff, Johnson 1981, p. 8]. For example, the metaphor *Time is money* produces expressions like *wasting time* and *saving time*, showing that the concept of time is a valuable resource. This proves that metaphors are part of the conceptual structure. While exploring the definition of concepts, Z. Fayzulloyeva likewise expressed the idea that concepts are metaphorical [Fayzulloyeva 2025, p. 393]. They form schemas, frames, and scenarios to organize knowledge, and revolve around prototypes. Furthermore, she claimed that concepts are embodied, i.e. arising from bodily and sensorimotor experiences. Conversely, A. Borghi suggested that abstract concepts, e.g. *freedom*, *justice*, represent one of the main unresolved problems for embodied cognition since it is pluralistic and relies on multiple interactive systems [Borghi 2020, p. 7].

In “The big book of concepts” G. Murphy treated concepts as “the glue that holds our mental world together” since they connect our past experiences with present perception [Murphy 2002, p. 1]. He criticized the Classical view, stating that it cannot explain how concepts actually function in human cognition due to having fuzzy boundaries. One of the strongest claims of the book is that concepts indeed have internal structure based on typicality effects. Concepts are dynamic representations embedded in broader knowledge systems, changing with expertise and experience, as well as differing across individuals and cultures. The book reviews major theories of concepts that arose from the classical view such as prototype and exemplar theories. However, it also referred to the knowledge approach stating the fact that “concepts are part of our general knowledge about the world” [Murphy 2002, p. 60]. In contrast, it should be noted, as T. Burge claimed, concepts are intentional ways of thinking whose identity depends on relations to the environment and cannot be reduced to definitions, individual beliefs, or explicit understanding. His famous anti-individualism explains that the content of many concepts depends on social and physical reality, not just individual mental states. For example, two people may have identical beliefs about *arthritis*, but if one lives in a world where the term

applies to a different disease, they have distinct concepts. This means that a person can have a concept even if their understanding of it is incomplete or partly wrong [Burge 1993, p. 309]. In addition to defining concepts as complex multidimensional mental formations within cognitive linguistic research, M. Slobodyan suggested that unlike notions, concepts include rational, emotional, and cultural components [Слободян 2010]. They exist both in individual and collective consciousness and are verbalized by language that communicates them, although some concepts remain non-verbalized. Since concepts have a complex mental structure, they can include images, representations, schemas, prototypes, frames, scripts, and gestalts, depending on how close it is connected to experience [Таценко 2008, с. 107; Розвод 2015, с. 147]. They form a concept sphere, where each concept is understood through domains (background knowledge areas). Concept sphere then manifests the entire conceptual and linguistic picture of the world [Плотнокова 2020, с. 92]. From a cognitive neuropsychological perspective, B. Mahon and A. Caramazza advanced the distributed domain-specific hypothesis, according to which domains are organizing principles of concepts. Within domains different types of information are processed in interconnected neural systems [Mahon, Caramazza 2009]. While defining systemic relations V. Ivashchenko distinguished between a concept as a fragment-minimum of knowledge about an object, and a concept sphere as a fragment-maximum, i.e. a structured set of interconnected concepts representing an entire domain of knowledge [Іващенко 2006]. R. Goldstone argued that conceptual structure is context-dependent as features that are important in one instance may become irrelevant in another [Goldstone, Kersten 2013, p. 615]. For example, the concept *child* can be interpreted in three different ways: in a legal context a child is a person under 18, in terms of family a child can be someone's daughter or son regardless of age, and in psychology using this concept can refer to cognitive and emotional development. Similarly, R. Langacker suggested that to know the meaning of a word is to know how we mentally conceptualize the situation [Langacker 1990, p. 30]. Every concept is understood relative to a cognitive domain or background knowledge, which constitutes a base, whereas a profile means what the concept highlights. For instance,

uncle profiles one person, but the base is the whole family network. Thus, in his study "Concept, Image, and Symbol", R. Langacker treated concepts as dynamic mental representations grounded in human experience, structured by cognitive domains and profiling, as well as expressed through language as symbolic conceptualizations. W. Petersen developed the premise and explained how concepts can be represented as frames, meaning structured packages of knowledge. Frames are hierarchical mental profiles that allow relations and can be expanded reflecting the way people actually think [Petersen 2021, p. 44].

S. Carey, who dedicated her work to the origin of concepts, confirmed the abovementioned theories of concepts being mental representations [Carey 2009, p. 13]. Despite the fact, she claimed that concepts are not all of the same type having the same origin. She argued against the continuity thesis, stating that all concepts are present from the start in some form. Instead, humans can create new conceptual systems that can have greater expressive power or otherwise be dissimilar from earlier ones. S. Carey introduced 'Quinian bootstrapping' as the main mechanism of concept innovation. This explains that humans acquire concepts by using existing representations, introducing placeholders, symbols, and analogies, followed by building a new representational system, which eventually reorganizes earlier knowledge. In this process, language solely plays the role of concept transmission, not creation. Moreover, some concepts exist in core cognition before language. Conversely, L. Barsalou refuted the belief that concepts are purely symbolic, claiming that they are based on simulations of real experiences [Barsalou 2003, p. 84]. He rejected the traditional view on concepts according to which the concept *car* is stored as a list of features. As a matter of fact, thinking about a car activates visual areas, motor areas, sound, and emotions. Concepts are flexible and appear to be simulations since the same concept looks different in different situations. Simulators, or category knowledge, show that we do not have one fixed image of the concept, e.g. a *dog*. Our brains store many experiences with dogs, creating a context-specific simulation and concrete mental version. Concepts enable categorization and

inference, while emotional reactions, evaluation, imagery, and stereotypes belong to the level of associative characterization [Camp 2015, p. 593].

In the article “Notion, Concept and Its Structure,” from the perspective of cognitive linguistics M. Polyuzhyn expressed similar view on the definition of concept in that it is not only a “mental unit and element of consciousness acting as a precursor between the real world and language,” but also a unit that is based on other sub-concepts, knowledge, emotions, experience, and associations in human consciousness [Полюжин 2015, с. 215]. Yet he tried to emphasize that concepts appear to be carriers of cultural information referring not only to thinking but also feelings and sensory experience. This premise generated two main approaches: *linguo-cognitive*, focusing on individual consciousness, thinking, memory, and categorization; and *linguo-cultural*, focusing on values, traditions, human connection, and collective meanings. The main idea represented by M. Polyuzhyn is that concepts possess certain internal structures, which gives a more unified approach to the analysis of concept structures, including more complex ones, than mentioned in earlier works of scholars. He promoted the idea that concepts have core that prompts sensory or visual image, is stable and shared, necessary for recognition (*bird* means wings, flying). Core is surrounded by cognitive layers that represent additional knowledge, different levels of abstraction, and can change. On the periphery or interpretive field lie proverbs, evaluations, opinions, cultural judgements, often contradictory and weakly structured. Periphery is the most flexible part of a concept, including sayings, stereotypes, and moral judgements that depend on context, time, culture. While analyzing linguistic approaches to the concept study Yu. Sharapanovska adopted this method, suggesting that concepts are three-component phenomena containing image component (sensory representations), information content (knowledge about the object), and interpretive field (evaluations, associations, emotions, and cultural meanings) [Sharapanovska 2021, p. 152]. Furthermore, M. Polyuzhyn considered three broader types of concepts: one-level concepts having only sensory core typical for concrete objects, such as *yellow*, *sour*, and *fork*; multi-level concepts having core and several abstract layers, such as

educated means can read, communicates well, professional competence; and segmental concepts, involving core and several equally important domains, such as *tolerance* can be political, religious, social, etc. He claimed that concept analysis should start from identifying the key lexical representatives of the concept in language, namely the linguistic forms through which the concept is most commonly expressed in discourse [Полюжин 2015, с. 221]. Subsequently, it is followed by the analysis of periphery with a variety of interpretations on the level of basic evaluations, proverbs, idioms, and other means of representation. Thus, this work provided a modern systemic method of concept analysis that can be subjected to further cognitive linguistic studies.

Although the assertion that concepts have internal structure is widely popularized, J. Prinz noted that they do not have a single internal structure that is always activated. He introduced a proxytype theory, which considers concepts to be temporary, context-dependent mental constructions stored in long-term memory networks. They primarily function as mechanisms for detecting and tracking categories in the world [Prinz 2002, p. 289].

Across contemporary cognitive linguistics, many linguists develop a broadly similar understanding of the nature of concepts. In the works of Ukrainian researchers such as A. Kulyk [Кулик 2024], S. Mangos [Манжос 2018], O. Khoroshun [Хорошун 2010], O. Hazuda [Газуда 2018], O. Dzherikh [Джеріх 2018], O. Zaychenko [Зайченко 2012], A. Prykhodko [Приходько 2020], O. Kutsos [Куцос 2022], S. Gladio [Гладьо 2021], E. Rozvod [Розвод 2015], T. Vryblevska [Врублевська 2014], V. Zhalai [Жалай 2012], A. Martynyuk [Мартинюк 2012], T. Piatkovska [Пятковська 2022], the concept is understood as a complex dynamic mental formation that integrates linguistic meaning, cognitive knowledge, cultural experience, and evaluative-emotional components. In their common perspective, concepts are discourse-based phenomena that possess diverse internal structures.

The emergence of the term concept led to the development of a research method called conceptual analysis. H. Valchev explained this methodological tool in the sense that it explores when a concept correctly applies by examining different

possible cases, aiming to determine which conditions are necessary, sufficient or neither for correct conceptual application [Valchev 2018, p. 131]. According to M. Slobodyan, the main purpose of conceptual analysis is to reconstruct the internal structure of a concept and identify its place within the linguistic picture of the world. This method is distinct from semantic analysis as it aims to reveal knowledge about the world encoded in language, rather than meanings of words and their relations within the language system [Слободян 2009, с. 105]. Otherwise, L. Shevchenko claimed that there is no single, universally accepted interpretation of this method since concepts are most fully revealed in discourse, which is also a factor influencing their change and development [Шевченко 2012, с. 52]. Conceptual analysis is understood as a procedure in which the concept itself is the object of analysis. Through this method researchers reconstruct the conceptual model by studying semantic fields, frames, prototypes, and metaphors since concepts serve as mediators between human cognition and linguistic expression [Шевченко 2012, с. 144]. Subsequently, N. Plotnikova introduced a three-stage algorithm for linguocultural concept analysis. The first stage is construction of the nominative field which means identification of linguistic means that objectify the concept in language, including direct nominations, synonyms, derivatives, and phraseological units [Плотнікова 2013]. The second stage includes identification of structural elements through the analysis of notional and cultural components, as well as historical, etymological, and modern layers. At the final stage, the field structure of the concept is modeled through identifying a core and a periphery. Furthermore, she supported the belief that concepts form the basis of concept sphere, structure the conceptual picture of the world, and are verbalized through language [Плотнікова 2020]. Alternatively, concepts can also be represented as frames, which is the foundation of another method called frame analysis applied for exploring the internal organization of concepts. In her article, O. Novosadska claimed that linguistic meaning is inseparable from frames as words evoke frames in the mind of a speaker [Novosadska 2018, p. 39]. They consist of fixed upper-level elements, which represent stable, expected aspects of a situation, and slots (terminals), which are variable, often filled by

subframes. This structure explains how humans process information by relying on pre-existing cognitive models.

Substantially, the notion of the concept occupies a key position in cognitive linguistics. However, it has been interpreted differently by scholars working within this paradigm. Various approaches highlight different aspects of conceptual structure. D. Geeraerts supported the idea that concepts are prototype-based, encyclopaedic, and context-dependent categories [Geeraerts 2006]. W. Croft and D. Cruse viewed concepts as structured dynamic mental representations organized in domains and frames accessed through profiling in language [Croft, Cruse 2004, p. 47]. In “The Oxford Handbook of cognitive linguistics” concepts are described as multidimensional cognitive formations shaped by embodiment and culture, as well as organized into domains and frames [Geeraerts, Cuyckens 2010, p. 9]. Ultimately, “The Routledge Handbook of Cognitive Linguistics” suggested that concepts are usage-based, constantly developed and reorganized through experience due to being shaped by frequency, discourse, and communicative practice [Xu, Taylor 2021, p. 4].

In conclusion, in this part the notion of concept as a central category in cognitive linguistics was explored. Concepts are widely regarded as dynamic mental constructs characterized by internal structure, context dependence, multidimensionality, and evaluative component. The overview of major approaches to concept studies supports a pluralistic perspective concerning conceptual nature. We also outlined the primary methods of conceptual analysis. These theoretical foundations build a framework for further cognitive and linguistic study of concepts in Modern English related to ecological discourse.

1.2 Ecological discourse in linguistics and concept formation

In the past few decades, ecological discourse has become the subject of contemporary scholarly interest and received a significant focus in linguistic research due to the growing awareness of environmental problems. Language has become a useful tool to shaping, interpreting, and conveying knowledge regarding

environmental issues, which renders ecological discourse an essential area for the development and evolution of ecological ideas. In a narrow sense, ecological discourse means professional communication about ecology. Speaking broadly, it involves all texts about human-environment relations: politics, media, literature, advertising. According to M. Banevych, it shapes ecological consciousness, encourages environmental responsibility and ethical treatment of nature [Banevych 2024]. Following concept studies and their findings, we concluded that one of the main characteristics of concepts is context-dependence. For this reason, we refer to ecological discourse as a linguistic environment, or ecolinguistics, in which ecological concepts are formed, structured, and verbalized. N. Hudz suggested that ecological discourse is a specific type of discourse whose aim is to reflect the interaction between humans and the environment, inform the public about the state of nature, and influence public consciousness [Гудзь 2013]. In addition to scientific knowledge about the environment, ecolinguistics reflects social values, cultural attitudes, and evaluative meanings concerning nature and environmental protection. M. Bortoluzzi presented a thorough overview of ecolinguistics in her recent work, claiming that language is closely connected to the environment and guides ethical values. It does not describe reality but actively shapes how people think and act within ecosystems [Bortoluzzi 2025].

The origin of ecolinguistics goes back to earlier linguistic and philosophical ideas about the link between language, thought, and environment. Wilhelm von Humboldt's views in the 19th century and the Sapir-Whorf hypothesis in the 20th century considered that language is deeply connected to how people perceive the world and interpret reality [Hordun, Kalynovska 2021]. In the context of ecological discourse, it implies that language can shape how humans understand nature. The appearance of the field of ecolinguistics is usually associated with E. Haugen and his book "The Ecology of Language" [Haugen 1972]. Later in the 1990s, M. Halliday proposed critical ecolinguistics, which became known as the "Halliday tradition," which includes the study of language and environmental problems. He argued that language is responsible for environmental destruction and called on linguists to

promote more ecological ways of speaking, which would then encourage people to think about nature not in terms of anthropocentrism, but rather ecosophy that prompts humans to consider themselves a part of nature without feeling superior [Halliday 2001]. Therefore, one approach is that language shapes concepts; concepts guide thinking; thinking influences behavior; and behavior affects the environment. This connection shows the interrelation between terms and mental concepts they construct due to external influence of different factors, such as metaphors, advertising, politics, environmental documents, or nature writings. Thus, we can observe that language plays a crucial role in concept formation within ecological discourse. S. Rudyshyn saw value in studying environmental discourse as it helps to analyze how language shapes ecological thinking. He supported the belief that reality is partly created by discourses that construct different understandings of ‘ecology,’ ‘nature,’ and ‘environment’ [Рудишин 2023]. In fact, ecological discourse analysis is now an independent linguistic paradigm.

While researching ecolinguistics as an emerging research field, S. Chen supported Haugen’s and Halliday’s traditions, also suggesting that this field functions on two levels. Macro-ecolinguistics has focused particularly on linguistic representation of ecology (its policy, power, diversity), whereas micro-ecolinguistics is yet developing with pursuit to determine how language constructs our relation to nature, and how metaphors shape ecological behavior [Chen 2016, p. 111]. It has evolved in a new direction from ‘bigger = better’ (more growth, resources, and consumption) to ‘small is beautiful’ (preservation, balance, stability) [Fill 2018].

In fact, R. Alexander and A. Stibbe suggested that ecological analysis of discourse, rather than vice versa, is the true core of ecolinguistics [Alexander, Stibbe 2014, p. 107]. It means studying how discourses shape human behavior and ways that either harm or protect ecosystems. Analysis of ecological discourse shows how people talk about the environment, whereas ecological analysis of discourse studies how any discourse affects ecosystems [Penz, Fill 2022, p. 12]. All areas related to molding environmental attitude have substantial matter, such as economics, advertising, animal industry, lifestyle magazines, and finance or business, in a sense

that they influence and track what people buy, how they treat nature, use resources, and understand progress. Thus, different groups of people, including governments, industries, media, etc., share ways of transmitting reality and value, or lack of both. For example, if some animals are described as ‘production units’, ‘livestock units’, or even ‘meat production units’, people consider factory farming normal. However, if we alter the structure of the source domain so that it activates linguistic units like ‘cruelty-free’, ‘animal rights’, people will get accustomed to treating animals accordingly. Animals should be conceptualized as beings, not resources that fulfill our needs and increase consumerism. In this way, industries may distance us from animals using technical terms, euphemisms, and objectification. Concept formation is a long process, and it requires some time to inspire people to change their attitudes at the time when many concepts are already deeply ingrained in human consciousness.

According to A. Stibbe, ecological concepts are linguistically driven cognitive constructs that affect how individuals view and engage with the natural world [Stibbe 2015, p. 2]. She argued in her book “Ecolinguistics: language, ecology, and the stories we live by” that ecolinguistics as an interdisciplinary field examines how language contributes to the ecological sustainability or destruction, aiming to identify, analyze, and assess the underlying conceptual structures in discourse so as to determine whether they promote environmentally detrimental or friendly ways of thinking. Nature, environment, sustainability, growth, and other ecological concepts are constructed through recurring linguistic features and shared cultural narratives, which the author calls “stories we live by.” These stories are “cognitive structures in the minds of individuals which influence how they perceive the world” and exist “between the lines” of texts. They can be embedded as mental models in advertisements, political documents, or educational materials, for example, the story of human superiority and separation from nature, or else, consumerism as a path to well-being. The book distinguished the following types of stories: ideologies, framings, metaphors, evaluations, identities, convictions, erasure, and salience. A. Stibbe’s analytical framework is based on the corresponding theories. Drawing on N. Fairclough’s approach, she relied on Critical Discourse Analysis that views

language as a form of social practice reproducing power relations, ideologies, and social inequalities [Fairclough 2003, p. 3]. Thus, ideology is “a story of how the world is and should be, which is shared by members of a group.” The frame theory primarily researched by G. Lakoff and E. Wehling in cognitive linguistics claims that words activate frames (structured packages of knowledge about certain areas of experience), which are resistant to change [Lakoff, Wehling 2012]. Similarly, framing is triggered by particular words that bring frames to mind. For example, climate change can be framed in different texts as a problem, threat, or predicament, which prompts distinct thoughts about it, as well as a course of actions or results. Similarly, the metaphor theory suggests that people understand abstract concepts through metaphorical mappings from more concrete domains. Metaphoricity requires activation of the target domain through verbalization of the source domain, image, gesture, and semantic oppositions [Müller 2008]. A. Stibbe explained that metaphor as a type of “story that uses a frame to structure a distinct and clearly different area of life” [Stibbe 2015, p. 17]. For instance, ‘climate change is a time bomb’ features ‘climate change’ as a target domain activated through ‘time bomb’ as the source frame, which triggers mapping relation due to the words ‘limited time’, ‘explosion’, ‘destruction’, ‘victims’, etc. The appraisal theory, introduced by J. Martin and P. White, explains how language encodes evaluation, and value judgements through linguistic means [Martin, White 2005, p. 136]. A. Stibbe characterized evaluation as a type of “story about whether an area of life is good or bad” [Stibbe 2015, p. 17]. ‘Economic success’ or ‘habitat loss’ both represent different emotional and moral responses. The identity theory, described by B. Benwell and E. Stokoe, examined how language constructs social identities and what it means to be a certain kind of person [Benwell, Stokoe 2006, p. 9]. Using descriptive linguistic means, we can draw an inference about who a person is as a customer, citizen, entrepreneur, etc. Another type of story is conviction, which is fact construction, manifesting whether “a particular description of the world is true, uncertain, or false.” Finally, the erasure theory suggests that “an area of life is unimportant or unworthy of consideration.” It refers to the omission or backgrounding of aspects of reality. Vice versa, the salience

theory claims the opposite. It focuses on what is made prominent and marginalized. These theories were explored by T. van Leeuwen [van Leeuwen, p. 101]. Correspondingly, erasure and salience are types of stories. Therefore, these theories shape concepts people have about the world, which influence ecological behavior, making language a key factor in sustaining or harming natural systems.

In contrast, A. Stibbe also conducted the study of Positive Discourse Analysis, arguing that ecolinguistics should not only focus on traditional ways of criticizing harmful behaviors and exposing bad stories. It must also actively seek better stories to live by that inspire people to care for the Earth and live sustainably. PDA tries to find new stories, for example, ‘cooperation instead of domination,’ ‘humans as parts of nature,’ ‘care instead of consumption.’ Thus, he examined nature writing, New Economics, Indigenous sayings, and Slow Food movement to show how language can make people feel connected to nature and construct positive thinking about its preservation [Stibbe 2017].

Apparently, concept formation in the human mind and language is the result of transforming real-world environmental knowledge. In the context of ecological concept study, we must adhere to a reversed order of relation focusing on objective reality (the real environment: forests, rivers, animals, climate) that influences human consciousness. Then it constructs concepts (conceptual world picture: nature, resource, pollution, biodiversity, sustainability) that are verbalized in language (linguistic world picture). Consequently, reality → mind (concepts) → language (discourse) → action is a key to a concept theory. At the same time, the conceptual world picture is broader than the linguistic one as not every concept has a direct word-carrier. Language does not mirror reality since reality is filtered through human consciousness. N. Kovalyk worked within a cognitive-discursive paradigm featuring discourse as a reflection of how people think, conceptualize, and categorize reality [Ковалик 2017]. Thus, ecological discourse is treated as a system of knowledge about nature structured in mind. She suggested that modern ecological views advance from anthropocentrism, stating that nature exists mainly for human use, to

ecocentrism, meaning that ecosystems have their own value, and people are their parts.

In her study, N. Kovalyk applied frame theory to model ecological discourse and described how the subdiscourse of ecology and natural resources is organized in it. Frame, as mentioned earlier in this paper, is a structured hierarchical mental schema that organizes knowledge about typical situations. The author argued that *Ecology and Natural resources* should be treated as a superframe within the larger frame of *Ecological discourse*. It is then divided into megaframes, such as mineral, water, land, recreation resources, etc. Macroframes, subframes, and microframes are smaller constituents of megaframes. For example, water pollution and water scarcity are elements of water resources. This relation assembles a whole network of frames for the purpose of systematizing ecological knowledge and showing relations between concepts. Frame modelling is a productive tool for analyzing ecological concepts [Ковалик 2017, с. 111].

One of the main goals of concept analysis is to determine how ecological knowledge exists in mind as a concept and how it is verbalized in words and terms. While analyzing the concept ‘ecology’, H. Bevzo applied a cognitive-linguistic and frame-based approach to examine the concept ECOLOGY in English and Ukrainian [Бевзо 2014]. According to the study, concepts are realized on the lexical and grammatical level and contain three components: notional component (direct meaning), value component (positive and negative attitude), and figurative component (associations and metaphors) [Бевзо 2014, с. 30]. The concept is viewed as the central concept of ecological terminology, because it includes ideas about nature, environment, environmental protection, and human-nature relations. She identified four main frames inside the concept ECOLOGY. The first frame concerns natural phenomena including *weather and natural processes* like *storm, hail, frost, cloud, and snow*. However, H. Bevzo claimed that, although this concept is universal, verbalization of the frame ‘natural phenomena’ can be culturally dependent. For instance, *snow* has different connotations in English and Ukrainian. In England snow is rarer occurrence than in Ukraine, which means that English usage of the word is

more descriptive and technical: “the small, soft, white pieces of ice that sometimes fall from the sky when it is cold, or the white layer on the ground and other surfaces that it forms” [89]. Conversely, in Ukrainian we can observe multiple labels to the word, e.g. *хурделиця*, *заметіль*, *завірюха*, which appeared due to diverse experience of this natural phenomenon and its frequent encounter. The second frame refers to flora and fauna: names of plants and animals. She distinguished *generic terms* (*trees, animals*) and *specific terms* (*oak, pine, dove, shark*). The third frame is related to the environment. It includes *negative ecological problems*, like *global warming* or *droughts*, and *positive images*, like *pure water* or *fresh air*. Environmental protection belongs to the last frame. This encompasses words related to *environmental problems* (*hazardous waste, acid rain*), *environmental action* (*preservation, regeneration*), as well as *organizations and policies* (*environmental programs, Green Party*). Thus, H. Bevzo showed that ecological concepts can have positive and negative connotations. The essence of grammatical verbalization displays how ecological meanings are structured in terms and phrases. They include simple terms (climate, nature, forest), compound terms (self-regulation, photosynthesis), and multi-word terms (non-renewable resources). This study demonstrated that concepts can be frame-based, realized both lexically and grammatically, revealing similarities and cultural differences between the two languages.

Similarly, M. Zhulinska investigated representation of the concept ENVIRONMENT by neologisms of English to determine the fashion of modern ecological thinking in society [Жулінська 2022]. In this case, she considered ENVIRONMENT as a key concept of the English worldview and divided neologisms into three main groups. The first group of words includes environmental problems and ecological catastrophes. They name dangers, crises, and negative consequences of human activity, such as *carbon footprint* or *pollution lockdown*. The second group includes environmental protection measures. Examples encompass *climate action*, *zombie batter*, *zero-emission vehicles*, *carbon counting*, and *Green Friday*. The last group describes human in the concept ENVIRONMENT, e.g. *eco-anxiety*, *ecological grief*; *planetarian*, *eco-guard*, etc. It means that neologisms have positive and

negative connotations. M. Zhulinska also found that the most productive word-formation method is compounding, especially usage of such elements as *climate*, *green-*, *eco-*. Therefore, she concluded that neologisms appear to be a response to real environmental changes. Most new words are about protecting the environment rather than harming it, which reflects growing ecological awareness.

Subsequently, another study conducted by N. Kovalyk and L. Tymochko showed how the concept WATER structured and used in the EU Water Framework Directive [Ковалик, Тимочко 2023]. The authors treated water as a universal concept that can expand with new knowledge. Following their investigation, they applied a three-step approach. The first step was linguistic observation as they counted every time the word occurred in a separate article of the Directive. The second step was based on frame analysis. They classified every appearance of WATER according to five frame types presented at the end of the 20th century by S. Zhabotynska: subject frame, action frame, possessive frame, identificational frame, comparative frame [Жаботинська 1999]. However, only three frames were suitable for the concept: subject frame (what water is and where it exists), action frame (how humans act on water), and the dominant possessive frame (water as something that has parts). The possessive frame prevailed as water is conceptualized mainly as a ‘water body’ that has parts with specific states and conditions. Thus, water is a structured natural entity, like lakes and rivers. The action frame describes humans as protecting water, restoring or damaging water bodies, or preventing its deterioration. The findings of the study revealed that water is treated not merely as a substance, but as a complex ecological and economic entity subject to human regulation.

N. Kovalyk, L. Tymochko, and N. Demchuk also explored the concept of WATER in the context of war [Ковалик, Тимочко, Демчук 2022]. They stated that water is not only a natural resource but also a strategic and political asset since during war water infrastructure becomes a military target, and control over water can be used as a weapon that threatens ecology, economy, and human safety.

Although in concept studies language is generally believed to play a less prominent role in concept formation, some instances show that scholars may give

language a more leading spot. C. Lakhan attempted to analyze the concept of SUSTAINABILITY in relation to cognitive accessibility, which promoted the model, where language forms concepts rather than vice versa [Lakhan 2024]. This is primarily the issue related to concept acquisition. However, contestably for one to acquire a concept, it is necessary to receive knowledge from an external source, which obviously obtained the same knowledge package from perceiving the reality, processing it in human consciousness, then molding it into a concept in order to transmit the concept in discourse, using linguistic means. Nonetheless, C. Lakhan drew on Mental Models theory suggesting that people build internal pictures of how the world works based on language. Clear language accessible to the public helps to construct accurate mental concepts and evoke desirable actions. In contrast, S. Bocking argued that ecological concepts are not neutral descriptions of nature since they actively shape how scientists, institutions, as well as societies see, organize, and manage the natural world, which makes ecological concepts tools of knowledge and power [Bocking 2015]. For instance, words like *forests* and *invasive species* exist only because of certain practices conducted by people who are guided by concepts of the world. The author introduced three key processes. Ecological concepts act as ways of seeing the world, especially phenomena that people cannot directly observe (*global climate change*, *energy flows*). They may be tied to placing, specific landscapes, or research sites. For example, migration concepts are shaped by North American landscapes, but once created, they can travel beyond their original place and become generalized. Most critical S. Bocking is regarding the third process imposing since ecological concepts often become tools of governance and management. Thus, the author shows that ecological concepts can be socially constructed, determined by places, practices, and power relations. They affect how people think about nature and influence environmental outcomes.

In conclusion, the analysis of ecological discourse showed that language strongly influences how people understand, evaluate, and interact with nature. Ecological concepts are shaped through discourse, culture, and human cognition, which makes them dynamic. The study also confirmed that ecological discourse

provides ecological concepts with linguistic context, through which they are formed and verbalized.

Conclusion to Chapter 1

Chapter 1 focused on a theoretical analysis that established the cognitive and linguistic foundations for studying ecological concepts in Modern English environmental discourse.

Key findings demonstrated that concepts are complex mental formations that integrate cognitive, linguistic, cultural, and evaluative components. The analysis of major approaches to concept studies confirmed the lack of a universal theory of concepts. Furthermore, the primary methods of concept investigation were identified, including conceptual, linguocultural, frame, and discourse analysis, which make it possible to explore conceptual structures, cognitive relations, and mechanisms of linguistic realization in discourse.

According to the research, ecological discourse functions as an important linguistic environment for ecological concepts. Language does not only reflect ecological reality but also shapes ecological thinking and environmental values. The chapter demonstrated that ecological concepts are realized through various discourse patterns, including framing, conceptual metaphors, and evaluations.

Therefore, the theoretical foundations discussed in Chapter 1 confirmed the close interrelation between language, cognition, and environmental reality, which provides the methodological basis for the further analysis of ecological concepts in Modern English environmental reports.

2. ECOLOGICAL CONCEPTS IN GLOBAL ENVIRONMENTAL REPORTS

2.1 Conceptual framing of ecology

The term ‘ecology’ stems from Greek words *oikos* (house, habitation) and *logia* (study of), which literally makes the concept of ecology a doctrine of housing. It was coined in 1866 by Ernst Haeckel and has acquired global significance for understanding the relation between humans, nature, and systems that function in the world. The framing of ecology is dynamic and not unanimous. It alters with the same pace as societal impact on the environment continues shaping ecology. It could also be argued that understanding ecology acquires different focus referring to major environmental issues. This leads to a contrast regarding what concepts surround ecology, why they appear, how they are realized in the human mind, and what actions people undertake because of their beliefs. In the following sections we included the abovementioned issues to analyze the nature of ecological concepts in Modern English based on international environmental reports that provide multiple perspectives on framing ecology, its domains, and what functions a concept model conveys.

Ecology is a complex concept itself since it triggers a variety of different images, associations, interpretations, and representations, when we hear it or try to highlight some aspects. Moreover, understanding of ecology may either coincide in many ways due to collective psychology or differ significantly between groups of people in the world. It is also based on the inferences we draw as ecology does not only encompass knowledge and perception of ecosystems, animals, plants, air, etc., but also links impact, causes, effects, dealing with issues, and other internal and external processes. Information people perceive about ecology in their environment, individual bodily experience, interaction shape concepts surrounding the term and multiple levels of interpretation. These levels are so strongly correlated and ingrained in consciousness that the human mind easily deciphers meanings if awareness of phenomena is sufficient. Following the illustrative materials, we analyzed how an

entire conceptual model related to ecology is constructed, what layers and components it involves, as well as how linguistic means shape cognitive nature of ecological concepts.

The corpus analyzed in this study consists of seven environmental reports in English published by formal organizations and research institutions. They explore urgent ecological issues, human and natural impact, sustainable transition, required environmental actions, and progress on the way to planetary health. The total volume of reports is 2487 pages. The materials were selected based on their relevance to the objectives of the study, the scope, and the global role in communicating environmental problems. The study was conducted using qualitative analysis, conceptual content analysis, as well as positive and critical discourse analysis to identify recurrent patterns and underlying ideological orientations. Primarily, the process of concept identification involved a close reading of the texts, focusing on executive summaries, introductions, key messages, and conclusions. Additionally, corpus managers were applied. Subsequently, we extracted recurrent lexical units, structuring them into conceptual categories of ecological representation based on shared meaning, thematic groups, and functional similarity across the reports. Words, phrases, and expressions were assembled to represent broader ecological concepts that are linguistically shaped. This sequence enabled systematization of data, reflecting dominant methods of addressing environmental issues.

In the process of cognitive linguistic analysis, one of the key findings concerned different ways the concept of ecology can be addressed, defined, verbalized, and framed in global environmental reports. In the examined corpus, semantically the term itself is not defined explicitly, yet it functions as an interconnected system that incorporates complex processes, layers of natural and human activity, and challenges such as climate change, biodiversity loss, and pollution. Ecology is not solely framed as relations between organisms and the environment. Instead, it is typically represented as a system that needs to be fixed and leveraged until it reaches a tipping point of destabilization, harming living beings, altering natural elements, and transforming our planet all together. For instance,

Planetary Health Check 2025 report conceptualizes ecology as a planetary-scale system of interdependent Earth processes directly linked with the stability, resilience, and life-support functions of the planet [Planetary Health Check...]. Unlike policy-oriented approach, ecology is constructed through such guiding principles as planetary health, planetary boundaries, and safe operating space. It is a condition of planetary balance capable of self-regulation that sustains civilization. At the same time, being affected by anthropogenic pressures, ecology may enter a risk zone that prompts emergence of a system that incorporates thresholds and tipping points instead. Similarly, ecology is described as a planetary condition under threat according to Global Environment Outlook, encompassing human well-being, equity, governance, and sustainability [Global Environment Outlook 7...]. However, it is primarily framed as a field of transformative change that requires systemic action. Alternatively, a more crisis-driven perspective is emphasized by the OECD in its report dedicated to the triple planetary crisis [Environmental Outlook on...].

One of the most consistent patterns across the analyzed reports is verbalization of ecology and its concepts through the language reflecting negative evaluation related to environmental crises, instability, etc. and positive evaluation that showcases progress (see section 2.3).

In contrast to the abovementioned approaches to addressing ecology, it can also be referred to as a strategic socio-economic condition that underpins prosperity, security, stability of society, infrastructure, finance, and public health. The European Environment Agency sees ecology as a foundation of European life, and its quality [Europe's environment and climate...]. Such components as resilience, natural resources, ecosystem services, climate adaptation, circularity, and responsible governance conceptualize the system. This suggests that ecology may be subject to control. A dominant trend is viewing it as a measurable, policy-governed project that is focused on competitiveness, implementation, acceleration, innovation, and achieving targets [European Union 8th...; Climate change 2023...]. Furthermore, a recurring feature is framing ecology as a system of risks, impacts, and vulnerability that can be reduced due to better adaptation and mitigation [Climate change 2023...].

Therefore, considering these interpretations, we observed that ecology is viewed as an umbrella concept that generates a network of related concepts to construct different kinds of knowledge about it. Based on corpora analysis and observations, we distinguished ecological concepts that appear most frequently in environmental discourse. They include crisis, adaptation, mitigation, transformation, sustainability, impact, and systemicity. These concepts are key to modern understanding of ecological patterns and trends, as they cover names of main processes that are essential to maintain ecology as a safe operating system. From the perspective of linguistic realization, we can suggest that these concepts create an entire lexical field. Moreover, they presuppose broader systemic interrelations, such as cause-effect links, ecological issues, natural responses, environmental action, etc. For this reason, we found it necessary to organize a framework for structuring cognitive layers of ecology, extending from core concepts to peripheral elements. Inspired by a frame theory by N. Kovalyk as a productive tool to modelling relations between ecological concepts (mentioned in the first chapter of the study), we assembled a unique hierarchical structure [Ковалик 2017]. Within this framework, ecology can be considered as a megaframe that encompasses such macroconcepts as sustainability, transformation, adaptability, resilience, governance, innovation, and impact. These primary units involve subconcepts that may further be divided into microconcepts. Macroconcepts, subconcepts and microconcepts construct cognitive layers and the periphery of environmental knowledge, building a conceptual model of a certain type (see section 2.4). Periphery includes broader elements under the concept of ecology. These relations are illustrated in Appendix 1.

In conclusion, analysis of the concept of ecology demonstrated that it cannot be treated with a narrow perspective, as it is multi-layered on a cognitive level and involves a series of secondary and tertiary concepts that build a strong knowledge foundation and induce various interpretations concerning environmental processes, influence, protection, and action.

2.2 Components of ecological domains

The hierarchical framework can be treated as a system approach to the study of ecological concepts. As a system, it is composed of related and dependent elements, which, when in interaction, form a complex whole. The system approach is the problem-solving methodology that uses the system orientation to define the problem and to develop necessary solutions. In the case of our analysis, it helps construct a series of interrelated concepts within the megaframe of ecology, in order to analyze how this structure functions and makes the necessary impact through language, contributing to the semantic capacity of its components.

Furthermore, the devised framework of ecological concepts displayed absolute interrelation between components of the structure, moving from abstract concepts to more concrete ones. This suggests that one of the key characteristics of conceptual structure is the level of abstraction. For example, the concept of sustainability appears to be abstract, giving us an idea about what might be implied under this label. It creates a domain of knowledge in the field of ecology that can be accessed and studied through language, as it is surrounded by different lexical units. These components are represented in the form of subconcepts and microconcepts due to the ability of broad interpretation, which is inherent in macroconcepts. This chain may extend even further.

According to M. Polyuzhyn's model, we can conclude that macroconcepts are core elements acting as structural centres, and their components convey more specific meanings. Subconcepts function as cognitive layers, and microconcepts produce context-dependent meanings, creating the periphery [Полюжин 2015].

Therefore, such dominant concepts as crisis, adaptation, mitigation, transformation, sustainability, impact, and systemicity act as core elements and are divided into a set of secondary concepts that build internal links, creating a unitary whole for the conceptual structure.

The core of the hierarchy represents a logically constructed system that connects different aspects of understanding modern ecology. The concept of CRISIS

demonstrates what the problem is, involving risks, threats, and hope for an evolutionary solution. It triggers the concept of ADAPTATION that focuses on strategies to adjust to effects, and MITIGATION that emphasizes effective reduction of causes. They lead to TRANSFORMATION that appears because of transition and systemic change. These processes demonstrate the overarching goal to achieve SUSTAINABILITY for a long-term balance of systems, and are evaluated through IMPACT, showing the consequences of environmental processes, and what environmental actions should be taken.

Therefore, these macroconcepts build a conceptual chain or systematic knowledge about the state of ecology. For that purpose, we should delve into the layer of macroconcepts to investigate their semantic capacity, mental representation, and other cognitive layers that appear within the conceptual structure. This helps the study provide a better understanding of ecological components essential for conducting further analysis and identifying interlinkages within the system based on conceptual representations across the reports.

The method of conceptual content analysis plays a key role in the whole study, as it enables the identification and interpretation of dominant ecological concepts. Through the analysis of lexical units, semantic patterns, conceptual relations, and recurring thematic elements, this method reveals how ecology is verbalized and framed. It also helps classify concepts, demonstrating the conceptual structure.

CRISIS. The macroconcept of crisis is usually imagined as an emergency, a disaster, and even a catastrophe. However, this understanding is not entirely truthful, since, unlike catastrophe, this concept demonstrates a turning point that still involves some hope for a transformative solution. This is particularly evidenced by the choice of linguistic means to indicate urgency and expected outcome (see section 2.3). Below, we exemplified two general representations of the concept.

1. Crisis is a state of planetary instability caused by human pressure.

According to A Scientific Assessment of the State of the Planet, crisis means crossing critical limits, loss of stability, intensifying process, risk of irreversible change, anthropogenic influence, and cascade effect [Planetary Health Check...]. It

triggers a chain of subconcepts that are linguistically realized through certain microelements (words and expressions).

- Ecological limits (microelements: *boundary transgression, planetary boundary, safe levels, zone of increased risk*);
- ecological imbalance (*destabilization, deterioration, worsening trends, decline, degradation, vulnerability, acceleration*);
- critical state (*tipping point, critical thresholds, ecological collapse, regime shift, irreversible change*);
- drivers of crisis (*human activities, pollution, fossil fuel combustion, land-use changes, industrial production, fertilizer overuse, emissions, stressors*).

In the Environmental Outlook, the concept of crisis is addressed similarly [Environmental Outlook on...]. However, it rather receives a status of a triple planetary threat, driven by socio-economic processes. Within the macroconcept of crisis, we can additionally trace the subconcepts of interdependence, environmental degradation (microconcepts: *biodiversity loss, climate change, pollution, ecosystem deterioration, species extinction, ecosystem services loss*), and climate disruption (*global warming, temperature increase, heat waves, wildfires, flooding, sea level rise, drought*).

2. Crisis is a systemic failure to meet environmental targets [Delivering the EU Green Deal...].

In the EU Green Deal report, the focus is replaced, as crisis is primarily embodied through such subconcepts as target failure, systemic environmental problems (*GHG emissions, biodiversity decline, resource consumption, waste generation*), structural and systemic barriers (*data gaps, lack of infrastructure, insufficient funding, misalignment between policies*), social and implementation challenges (*social risks, low public awareness, insufficient community engagement, regional disparities*). Likewise, EEA's monitoring report emphasizes accelerating risks, failures, and insufficient progress [European Union 8th...]. The UNEP report

also mentions the costs of inaction and inequality caused by unbalanced consequences of crisis [Global Environment Outlook 7...].

ADAPTATION. The macroconcept of adaptation is related to the process of adjusting systems to changing and destabilizing conditions. It may be understood through such components as:

- vulnerability reduction (microconcepts: *vulnerability, vulnerable groups, inequality, resilience increase, inclusion, equity, justice, human health, social and distributional concerns, affordability, access to food and energy*);
- response to climate risks (*extreme events, floods, droughts, heatwaves*);
- risk management (*trade-offs, unintended impacts, policy gaps*);
- system adjustment and flexibility (*feedback processes, interactions, self-regulation*);
- infrastructure adaptation (*renewable energy infrastructure; power grids, electric charging stations, alternative fuels, land-use planning*);
- food system adaptation (*sustainable diets, affordable healthy food, food security, technological innovation uptake*);
- multi-level response (*global efforts, monitoring, decision-support services, practical strategies: irrigation, agroforestry, urban greening, early warning systems*).

MITIGATION. The macroconcept of mitigation is typically referred to as the process of reducing environmental pressures and preventing further destabilization of the Earth system through the following subconcepts:

- emission reduction (microconcepts: *greenhouse gas emission, radiative forcing, CO₂ concentration, decarbonization, methane emissions, emission hotspots*);
- reduction of pollution and resource pressure (*fertilizer overuse, nutrient losses, pesticides, dead zones, synthetic pollutants, plastics, chemical compounds, waste volumes; recycling, material recovery, circular economy, raw materials, minimizing waste, resource efficiency*);

- energy transition (*renewable energy, electrification, energy system, clean energy, power grids, energy efficiency*);
- climate targets (*climate change, climate neutrality*);
- control and intervention (*governance, measurement and monitoring, control variables, diagnostics, tracking, assessment, regulation; prevention, leverage points, solutions, systemic action in the energy sector, transport, industry, agriculture, building*);
- technological and infrastructure solutions (*innovation, cleantech, behavioral change, electric charging stations, hydrogen infrastructure, renewable fuels, biofuels, grid expansion*).

SUSTAINABILITY. The concept of sustainability is widely recognized as the main target of all efforts to maintain ecological balance. It is a desirable future state of socio-ecological systems where planetary health, human well-being, and justice are ensured through systemic transformation. The concept can be expanded through the following components to develop a deeper understanding:

- stability (*microconcepts: system balance, sustainable development, resilient Earth system, ecosystem health, emission reduction, temperature control, human well-being, equity, justice, environmental safety*);
- resilience (*self-regulation, ability to absorb disruptions, functional integrity*);
- life-support functions (*biosphere, climate system, ecosystem functions, ocean as regulator, heat storage, planetary health, carbon sequestration*);
- human pressure (*dominant force, fossil fuel combustion, non-CO₂ emissions, land-use changes, fertilizer overuse, pollution, industrial production, biomass harvesting, deforestation*);
- resource efficiency (*circular economy, recycling, material recovery, reuse, reparability, waste reduction*);
- transformation (*system change, transition, clean technologies, reduction of environmental footprint*);
- governance (*national approaches, regulation, policy objectives*).

IMPACT. The concept of impact presupposes the measurable and observable consequences of human activity and environmental change on ecosystems, climate, and human systems:

- environmental consequences (microconcepts: *climate change, ecosystem degradation, biodiversity loss, land degradation, erosion, ocean acidification, pollution, loss of natural productivity, escalation*);
- climate and physical effects (*global warming, temperature anomalies, heatwaves, droughts, flood risk*);
- ecological damage (*loss of genetic diversity, extinctions, ecosystem function loss, biocomplexity declines*);
- resources depletion (*forest loss, soil moisture changes, reduced water availability*);
- human consequences (*health burden, living conditions, fatalities, security, vulnerable groups, loss of lives, economic loss, unequal distribution*).

SYSTEMICITY. The concept of systemicity refers to one of the main principles of ecology, which is the understanding of the Earth as an interconnected system of processes, feedback, and interactions, where changes in one component affect the stability of the whole system. It encompasses such subconcepts as interconnectedness, cross-system interactions, planetary unity, causal structure, socio-economic drivers, synergies and trade-offs, policy integration, and coordination.

TRANSFORMATION. The concept of transformation demonstrates a system-level change in how society and nature interact. This is the outcome of environmental protection and all the processes taking place, which is reached by an active implementation of strategies, understanding of planetary and human needs, as well as acting in Earth's favor. Surrounding subconcepts may include transition, innovation, behavioral change, reduction of pressures, and other concepts-components already mentioned previously.

Consequently, we distinguished seven abstract macroconcepts central to the megaframe of ecology, analyzing their representation across environmental reports.

This helped us to highlight the most frequent constituents of ecological domains with core and peripheral elements that construct understanding of the complex conceptual structure through more concrete vocabulary.

2.3 Linguistic realization of ecological concepts

Analysis of ecological concepts in terms of their structure, hierarchy, and cognitive capacity contributes substantially to identifying interlinkages between concepts and places they hold in collective perception, according to the orientation applied across the illustrative material.

However, one of the key principles that guides our understanding of concepts is the usage of diverse linguistic means. Specific language helps to determine the ways different organizations address ecology, demonstrating the urgency and significance of the processes within its boundaries. Language is applied as a conceptualization tool, which does not only describe ecological reality but also thoroughly constructs it. Hence, ecological domains are cognitive structures that are linguistically realized in the reports.

The previous section dedicated to the structural elements of ecology contains several clues concerning the linguistic realization of ecological concepts, such as ways of verbalization, positive and negative evaluation, choice of language devices to emphasize the nature of environmental processes. This list can be further expanded, as the language in the reports can also be classified in other dimensions regarding semantic fields, variety of lexical units, grammatical, and syntactic functions, metaphoricity, modality, etc. These means are actively present in the texts, creating patterns that show how ecological concepts are encoded, structured, and communicated through language. Thus, it activates the field of cognitive linguistics.

On the lexical level, concepts are represented in different ways. Firstly, they are marked by the corresponding key terms. For example, the concept of crisis includes boundary transgression, tipping point, destabilization, drivers of crisis, and other expressions mentioned previously. According to cognitive capacity, they are

considered to be subconcepts or components of conceptual structure. At the same time, these word combinations function as terms, according to their linguistic orientation, representing the respective concepts and forming the terminological structure.

By lexical-semantic field, concepts can be realized through thematic groups, containing the following six elements.

1. The risk component is realized through linguistic means, indicating potential danger and urgency.

For example, *“The triple planetary crisis of climate change, biodiversity loss, and pollution poses a growing threat to the environment and the economy”* [Environmental Outlook on..., p. 14], *“Earth’s climate is in the danger zone: greenhouse gas concentrations have reached record levels; global warming appears to be accelerating, and conditions are continuing to worsen”* [Planetary Health Check..., p.13]. These sentences certainly evoke unsettling feelings and perceptions in a recipient. Such an effect is achieved through ‘triggers’ (specific vocabulary): crisis, to pose a growing threat, a danger zone, to reach record levels, to accelerate, to worsen. They indicate a sense of urgency, which conceptualizes ecology as a system in danger and crisis requiring quick action and healthy human intervention. Thus, by reading or hearing certain information about the environment, ecological states, we begin to acquire a concept of modern ecology, and what it looks like. Due to urgent messages, we conclude that ecology is something people should be concerned about at present and in the future.

2. The cause component is demonstrated through the use of vocabulary related to causality.

For example, the sentence *“In agricultural systems, the erosion of crop genetic diversity undermines productivity and resilience to climate change”* [Global Environment Outlook 7..., p. 88] contains a causal marker ‘undermine’, which demonstrates the relation between a causal element ‘erosion’ and an impact element ‘productivity and resilience’, helping to establish cause-effect links in our mind.

3. The impact component is stressed by lexical units denoting consequences.

For example, *“Pollution continues to reduce quality of life in Europe significantly; millions of years of healthy life are still lost each year due to pollution and at least 10% of premature deaths are driven by exposure to polluted air”* [Europe’s environment and climate..., p.12]. Such elements as ‘reduce quality of life significantly’, ‘years of healthy life are lost’, and ‘premature deaths’ demonstrate the impact made by nature and human activity.

4. The change component refers to dynamic processes over time.

The sentence *“The recent acceleration in the decarbonisation of the EU electricity supply offers an encouraging sign of systemic transformation of EU energy system”* [European Union 8th... p. 12] contains triggers like ‘acceleration’ and ‘systemic transformation’, which emphasize the process of positive change, involving attempts to mitigate challenges and adapt to evolving ecological states. However, changes may also be negative, for example: *“The likelihood and impacts of abrupt and irreversible changes in the climate system increase with further global warming”* [Climate Change 2023..., p. 18].

5. The action component represents control and human response.

The orientation of the sentence *“The EU is striving to achieve climate neutrality by 2050 through a sustainable green transition. An unprecedented effort was started with the EGD”* [Delivering the EU Green Deal..., p. 4] helps to create an image of ecology as a governed and managed system due to receiving extraordinary efforts.

6. The progress component demonstrates a degree of achievement, positive dynamics, effectiveness, and a comparison to past experience.

For example: *“The ozone layer remains stable and is showing signs of slow recovery, maintaining protection against harmful radiation”* [Planetary Health Check..., p.16]. The specific use of linguistic means repeatedly illustrates the ways our perception of the world is affected and built based on external influence and information we receive. In this example, a tendency towards improvement and sustainability is showcased through such elements as ‘remain stable’, ‘show signs of slow recovery’, and ‘maintain protection’.

All these components interact, creating a unified system of knowledge and understanding of ecological concepts. Yet the most vivid element dominating across the reports is the risk component, which explains the reason why modern global ecology is treated with caution. More examples are represented in Appendix 2.

In addition to these triggers, the environmental reports contain many ecological terms and evocative vocabulary that prompt negative or positive associations. Evaluative vocabulary is instrumental in shaping ecological concepts as long as words remain cognitively marked. For example,

- negative evaluation can be exemplified by such terms as:

environmental degradation, extinction, acidification, biodiversity loss, pollution, environmental pressure, vulnerability, soil erosion, water scarcity, deforestation, unsustainable use of resources;

- positive evaluation items:

sustainable development, climate neutrality, green transition, resilience, mitigation, adaptation, circular economy, renewable energy, ecosystem restoration, conservation, environmental protection, decarbonization, emission reduction.

Evaluative vocabulary also includes positive verbs (*to improve, to recover, to protect, to restore, to reduce, to transition, to regulate etc.*), negative verbs (*to escalate, to worsen, to exceed, to overload, to threaten, to disrupt, to weaken etc.*), positive adjectives (*efficient, resilient, renewable, systemic, robust, green, innovative etc.*), and negative adjectives (*severe, alarming, critical, high-risk, unsustainable, harmful, extreme, deadly etc.*).

Another linguistic means applied is comparative structures, including comparative adjectives, adverbs, and constructions. Their role is to present information in an evaluative way, comparing environmental conditions, trends, risks, and levels of progress, as well as demonstrating how environmental situations develop over time. For example: “*Extreme heat, once rare, is becoming more frequent, with deadly consequences*” [Europe’s environment and climate..., p.11], “*Global surface temperature has increased faster since 1970 than in any other 50-*

year period” [Climate Change 2023..., p. 4], “*The ocean’s role is more threatened than ever*” [Planetary Health Check..., p. 18].

In addition to lexical and evaluative means, ecological concepts are also realized through conceptual metaphors. They demonstrate how abstract ecological phenomena are interpreted through more concrete conceptual domains and reveal the associative frameworks through which ecological processes and challenges are understood. Such metaphors are not always explicitly observable at the surface level of the text. However, they emerge through cognitive mechanisms of perception and interpretation based on the interaction between source and target domains within language. These domains are interconnected through the process of mapping, which refers to the transfer of conceptual features from a source domain to a target domain. These elements constitute the metaphor theory explored by A. Stibbe, which states that metaphoricity appears when one concept is understood through another concept expressed by words, images, gestures, or semantic contrasts [Stibbe 2015]. We distinguished five striking metaphors across the analyzed material.

All seven reports anthropomorphize the planet and its ecosystems, presenting them as living entities capable of suffering, weakening, and recovering, which constitutes the first conceptual metaphor of ECOLOGY AS A LIVING ORGANISM:

Source domain: the human body (medicine, health care);

Target domain: the environment, Earth system (*Planetary Health Check; planetary health; Earth’s current health; healthy ocean; ecosystem recovery; nature’s safety; environmental shock*).

This conceptual metaphor is realized through mappings between the source domain of human health and the target domain of ecology: healthy body – healthy planet; disease – ecological crisis; diagnosis – environmental assessment; recovery – ecological restoration. The function of this linguistic realization is to emphasize vulnerability of ecosystems, correlating them with the human health system. Within the framework of planetary health, several direct metaphors are represented, such as “*The Ocean: The Unsung Guardian of Planetary health*,” which implies the role of the ocean as a living protective force supporting life on Earth, yet often

underappreciated [Planetary Health Check..., p. 18]; “*Earth’s health keeps the window open for returning to a safe operating space. However, this window is closing fast,*” conceptualizing the planet as a living organism whose condition requires protection and recovery while representing diminishing opportunities for ecological action [Planetary Health Check..., p. 19].

Further conceptual metaphor refers to ECOLOGICAL STATE AS WAR, applied to intensify the perception of danger:

Source domain: war (emergency, conflict, disaster, crisis, battle, casualties, borders, invasion);

Target domain: *environmental problems and climate change (a planet in crisis, addressing the crisis, to fight climate change, urgent action, threats to humanity, to become deadlier, to claim lives, a dead zone, fatalities; boundary transgression; crossing critical tipping points, to enter the high-risk zone);*

Mapping: crisis – environmental instability; action – intervention, emergency – urgency of response.

Further conceptual metaphor marks ECOLOGY AS A SYSTEM UNDER PRESSURE through such components as:

Source domain: physical force (mechanics, mechanical pressure, engineering systems);

Target domain: ecological systems (*increasing pressure, mounting stress, to overload land and water, to push Earth beyond its Safe Operating Space, destabilization, acceleration, leverage point, climate crisis shifting into overdrive, building resilience, overshoot*);

Mapping: pressure – environmental burden; overload – ecological imbalance; destabilization – system failure.

Representing SUSTAINABILITY AS A JOURNEY is conceptualization of movement toward a desired future:

Source domain: journey (movement toward destination, direction, movement);

Target domain: sustainability transformation (*green transition, pathways to sustainability, thresholds, roadmap of transformation, moving toward climate neutrality, evolving progress, drivers of change*);

Mapping: pathway – sustainable development; destination – ecological stability; movement – transformation process; direction – policy orientation.

Additionally, the Planetary Health Check report figuratively explains the concept of a tipping point, comparing it to ‘a cliff at the end of a road’. “If a driver continues without braking, they may drive over the cliff, a point from which it is quite difficult (if not impossible) to return.” In this metaphorical framework, environmental change is conceptualized as a journey in which humanity acts as a driver moving toward a potentially irreversible point. The ‘cliff’ symbolizes ecological collapse or a critical tipping point, while the inability to return emphasizes the irreversibility of environmental damage once certain limits are crossed [Planetary Health Check..., p. 43].

The fifth conceptual metaphor features NATURE AS A SUPPORT SYSTEM, emphasizing human dependence on nature.

Source domain: infrastructure (support mechanisms, technical systems);

Target domain: ecosystems and biodiversity (*natural capital, resource efficiency, life-support functions, supports conditions necessary for life, ecosystem services*);

Mapping: support system – ecosystems; destruction – ecological collapse; maintenance – environmental protection.

These conceptual metaphors perform several important functions. They create emotional and evaluative framing; intensify the vision of environmental risks, urgency, and necessity for action; represent ecology as an interconnected system; and support transformation narratives.

Beyond implementation of the metaphor theory, the reports actively employ different grammatical categories, such as passive voice, nominalization, impersonal structures, etc. Modality plays a substantial role in the linguistic representation of ecological concepts within environmental discourse. Modal expressions in the reports

most frequently function to convey necessity, possibility, and prediction. For instance, “*Effective action is needed to address the underlying causes of unsustainability, and this action must be transformative*” [Global Environment Outlook 7..., p. 19]; “*Improving policymaking and enforcement is essential and requires urgent action*” [Global Environment Outlook 7..., p. 31] (necessity).

Additional examples include modal verbs and modal expressions such as *should, need to, have to, to be required, to be necessary, to be essential, to be urgent, and to be crucial*, which appear frequently to express obligation, urgency, and necessity. For example: “*Earth system components can shift irreversibly to destabilized states*” [Planetary Health Check..., p. 12]; “*This could result in an irreversible ecosystem transition*” [Global Environment Outlook..., p. 115] (possibility).

Possibility is further conveyed through expressions such as *may, might, to have the potential to, to be possible, to enable, and to allow*. For example: “*Looking ahead, the deterioration in the state of Europe's biodiversity and ecosystems is expected to continue, with future policy objectives unlikely to be met*” [Europe's environment and climate..., p. 9] (prediction), “*In the near term, every region in the world is projected to face further increases in climate hazards*” [Climate Change 2023..., p. 98].

Predictive modality within the reports is also commonly realized through expressions such as *will, to be projected to, and to be estimated to*.

Therefore, modality contributes to the interpretation of ecological concepts.

The linguistic realization of ecological concepts is also manifested through syntactic structure. On the syntactic level, the frequency of complex sentences can be observed. Cause-and-effect relationships are realized through causal structures, composed of the cause element, causal marker (connectors: *because, due to*; verbs: *to lead to, result in, to trigger, to cause, to drive, to contribute to, to undermine, to push, etc.*), and the impact element. For example: “*Fossil fuel combustion, land-use changes, and pollution have pushed Earth beyond its Safe Operating Space*” [Planetary Health

Check..., p. 12]. The cause element is ‘fossil fuel combustion, land-use changes, and pollution’; a causal marker is the verb ‘to push’; the impact element is ‘Earth’.

Other examples include ‘*climate change intensifies biodiversity loss*’, ‘*land degradation triggers severe droughts and heatwaves*’, ‘*plastics disrupts ocean ecosystems*’, ‘*deforestation and land degradation reduce vegetation’s ability*’, ‘*regime shifts would trigger widespread ecological collapse*’ [Planetary Health Check..., p. 12].

Causality is often employed implicitly by means of more neutral verbs like *to reduce, to accelerate, to disrupt, to weaken, to intensify, to compound, to breach*. For example, “*Loss of planetary resilience is compounded by regime shifts and reduced functional integrity*” [Planetary Health Check..., p. 12].

The reports also contain conditional constructions that express hypothetical ecological scenarios and potential outcomes, indicating a condition that must be met through three recurrent patterns.

- 1) IF-clause: “*If insufficient action is taken, there will be further acceleration in the rate at which species become extinct around the world*” [Environmental Outlook on..., p.18]; “*This could result in an irreversible ecosystem transition if certain critical thresholds or tipping points are reached*” [Global Environment Outlook 7..., p.115].
- 2) Prepositional phrases including WITHOUT: “*Without effective interventions, the probability of extreme wildfires will increase globally*” [99, p. 115]; “*Without environmental resilience, we cannot have long-lasting security*” [Europe’s environment and climate..., p.21].
- 3) WHEN-clause: “*When both co-benefits and trade-offs are fully considered, ... policies result in immediate net benefits globally*” [Global Environment Outlook 7..., p. 116]; “*When the demand for water exceeds supply, drinking water and food security are threatened*” [Europe’s environment and climate..., p. 123].

These patterns complement and reinforce the linguistic representation of ecological concepts.

Consequently, the linguistic realization of ecological concepts demonstrates that environmental discourse is constructed through lexical and grammatical means. The linguistic mechanisms not only describe environmental reality but also actively participate in its conceptualization, influencing the human interpretation of ecological risks, responsibilities, and future scenarios.

2.4 Ecology as a conceptual model

The framing of ecology, the cognitive representation of its components, and the typical linguistic means through which ecological concepts are understood play an essential role in shaping environmental discourse.

From the perspective of cognitive linguistics, ecology can be interpreted as a conceptual model formed through the interaction of linguistic, cognitive, and discourse mechanisms. Environmental reports structure ecological knowledge by organizing concepts into hierarchical relations, thus constructing a particular vision of environmental reality.

The general conceptual model identified in the reports represents ecology as a vulnerable system affected by human pressure, currently experiencing crisis and requiring systemic transformation. It is supported by recurrent discourse patterns, such as problem–consequence (presenting environmental issues as cause–effect chains; mitigation and adaptation measures), problem–solution (representing ecological issues through a structure in which environmental problems are followed by proposed response or transformation pathways), risk–response (presentation of environmental threats followed by actions intended to reduce, manage, or prevent their consequences), systemic causal pattern (represented through sequences such as “drivers–pressures–impacts–responses”), and progression pattern (showing development and building prediction).

These discourse patterns activate several dominant frames: crisis frame, system frame, transformation frame, sustainability frame, action frame. Their presence is revealed through the interaction of macro-, sub-, and microconcepts together with

linguistic means that collectively structure the representation of ecology within the reports. These elements construct a conceptual model of understanding ecology, whose pragmatic and cognitive function is to inform people, warn about risks, persuade society and policymakers to act, and present transformation as the main solution to ecological instability. Appendix 3 illustrates the conceptual framework of ecology. This indicates that the conceptual model reflects a particular ideological action-driven orientation that is conveyed through reality → concepts → linguistic choices.

In conclusion, the analyzed reports demonstrate that ecology is represented as a complex and interconnected conceptual model shaped through language, cognition, and discourse. Ecological concepts interact with one another to create a unified vision of environmental reality. Within this model, ecology is understood as a vulnerable system influenced by human activity, exposed to risks and crises, yet still capable of transformation and sustainable development through appropriate action. It raises awareness of environmental challenges and encourages responsibility and action toward the sustainable future of the planet.

Conclusion to Chapter 2

The practical analysis of ecological concepts across global environmental reports in Chapter 2 revealed that ecology is portrayed as a multidimensional cognitive and linguistic construct.

It was determined that ecology is an interconnected system associated with crisis, sustainability, transformation, adaptation, mitigation, impact, and systemicity. These dominant macroconcepts form a hierarchical conceptual structure. Furthermore, the study indicated that ecological concepts are actively verbalized through lexical and grammatical means.

The reports construct ecology as a conceptual model supported by dominant frames, including crisis, system, transformation, sustainability, and action frames. These elements serve informative, cognitive, pragmatic, and persuasive functions by

warning about ecological risks, emphasizing urgency, and promoting systemic transformation as the principal route to environmental stability and sustainable development.

Therefore, the conducted analysis established that language functions as a mechanism of conceptualization that structures ecological knowledge and influences the understanding of humanity's connection with nature in modern conditions.

CONCLUSION

The purpose of this thesis was to investigate approaches to the study of cognitive and linguistic aspects of ecological concepts in Modern English environmental discourse, while also providing practical analysis of the nature and peculiarities of ecological concepts in global environmental reports. This aim was achieved through the fulfilment of the research objectives.

The theoretical analysis demonstrated that concepts constitute fundamental units of cognition and play a central role in cognitive linguistics. They represent complex, dynamic, and context-dependent mental formations, which combine cognitive, linguistic, cultural, emotional, and evaluative components. Following the Containment model, concepts may possess hierarchical organization, consisting of core and peripheral elements, frames, prototypes, schemas, and cognitive layers. Furthermore, language functions as an important mechanism of conceptual verbalization and interpretation. The research also demonstrated that ecological discourse is a crucial area of study in ecolinguistics that shows how ecological concepts are formed, structured, and communicated through discourse mechanisms.

The practical analysis of ecological concepts provided a comprehensive understanding of ecology as a multidimensional conceptual system. It is conceptualized not merely as the relationship between organisms and their environment but as a complex system characterized by vulnerability, interdependence, environmental risks, and the necessity for transformation. The research established a hierarchical organization of ecological knowledge represented through macroconcepts, subconcepts, and microconcepts that collectively form the megaframe of ecology. Moreover, due to conceptual content analysis and the system approach, seven dominant macroconcepts were identified: crisis, adaptation, mitigation, sustainability, impact, systemicity, and transformation. These concepts construct cognitive layers in the form of a conceptual chain referring to the state of ecology, environmental risks, responses, and directions toward sustainable development.

The study also emphasized that ecological concepts are realized through a wide range of linguistic means, including terminology, evaluative vocabulary, thematic lexical groups, modality, comparative structures, causal and conditional constructions, and conceptual metaphors. The research revealed dominant semantic components: risk, cause, impact, change, action, and progress, with the risk element and evaluative vocabulary affecting the construction of public understanding of ecological issues. Subsequently, such central conceptual metaphors as ecology as a living organism, ecological state as war, ecology as a system under pressure, sustainability as a journey, and nature as a support system were distinguished. The figurative aspect helps to represent practical associations to explain abstract ecological phenomena, making them more accessible.

All things considered, the research showed that conceptual structure and linguistic means constitute a whole model. This unified framework influences how people perceive and respond to environmental issues. Modern environmental discourse presents ecology as a vulnerable system facing numerous challenges, while at the same time highlighting the possibility of positive change through adaptation, transition across different sectors, sustainability, and environmental action. Thus, ecological concepts serve not only to describe environmental realities but also to influence attitudes, raise awareness, and encourage responsibility towards environmental protection.

Consequently, the results of the study contribute to the development of cognitive linguistics and ecolinguistics by providing an integrated analysis of the conceptual organization of ecological knowledge. The findings offer a deeper understanding of how ecological ideas are organized and communicated through language. Future research may further explore ecological concepts in other types of discourse, e.g. media or political contexts. Other ways of investigation may focus on cultural perspective, diachronic development, or classification-based approaches.

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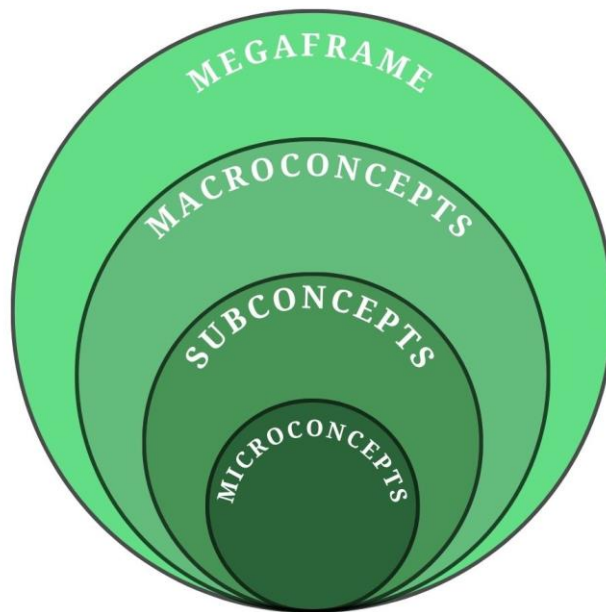
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APPENDICES

APPENDIX 1

HIERARCHICAL FRAMEWORK OF ECOLOGICAL CONCEPTS



COMPONENT-BASED CLASSIFICATION OF THEMATIC LEXICAL GROUPS

<i>Components</i>	<i>Examples</i>
Risk component	nouns/phrases: <i>increasing pressure, a danger zone, a high-risk threshold, emerging risks, converging hotspots, a burden, urgency of planetary crisis, an unprecedented threat, a tipping point, catastrophic consequences, an imminent risk, warning signs, inability to meet targets, persistent pressure, over-exploitation;</i> verbs/expressions: <i>to reach critical levels, to threaten, to cross critical tipping points, to heighten risk, to breach safety thresholds, to reach record levels, to pose a threat, to face mounting stress, to become deadlier, to claim lives, to continue to grow, to amplify negative effects, to draw urgent attention, to enter a high-risk zone, to expand rapidly, to escalate steeply, to affect adversely, to constitute a challenge;</i> States: <i>there is no sign of improvement, no improvement in sight, to be below safe levels, to exceed safe levels, to remain persistently breached, to be exposed to excessive heat.</i>

<i>Components</i>	<i>Examples</i>
Cause component	nouns: <i>drivers, pressures;</i> verbs/expressions: <i>to undermine, to trigger, to compound, to push, to lead to, to cause, to continue to overload, to affect, to drive, to contribute to, to result in, to hinder capacity, to intensify pressures, to induce.</i>
Impact component	nouns/phrases: <i>deterioration, destabilization, disruption, significant decline, biodiversity loss, degradation, widespread collapse, extinction, severe decline, boundary transgression, instability, depletion, disaster, vulnerability, widespread damage, harm to biodiversity, climate-related conflicts, health costs, destruction, death, water insecurity/scarcity, unsustainable water use, weakened immune system, glacier melt, surpassing planetary boundaries, environmental inequalities, reduced resilience, limited results, environmental harm; severe impacts, natural disturbances, fatalities;</i> verbs/expressions: <i>to breach boundaries, to disrupt, to impede marine life, to reduce ability, to overload land, to interfere with, to put pressure on, to deplete reserves, to raise concerns, to</i>

<i>Components</i>	<i>Examples</i>
	<i>severely deteriorate, to jeopardize livelihoods, to deepen inequalities, to intensify poverty, to be ravaged.</i>
Change component	nouns/phrases: <i>regime shifts, an irreversible change, a systemic transformation, a transformative change, acceleration towards targets, transition towards sustainability, evolving progress;</i> verbs/expressions: <i>to intensify, to accelerate, to continue to worsen; ocean is turning more acidic; to shift irreversibly, to weaken; forests are shrinking; to exacerbate, to escalate steeply, to become more frequent and prolonged/intense, to warm much faster, to change at an alarming rate, to increase in severity.</i>
Action component	nouns/phrases: <i>effective governance, leverage points, risk assessment, robust measurement, monitoring, scaling, solution pathways, coordination, collective pursuit, mitigation strategies, conservation of ecosystems;</i> verbs/expressions: <i>to regulate, to enhance, to integrate, to monitor, to measure, to refine, to examine, to protect, to track, to respond to risks, to</i>

<i>Components</i>	<i>Examples</i>
	safeguard, to call for, to implement, to collaborate, to acknowledge urgency, to move toward, to decrease consumption, to manage, to envision new solution pathways, to break away from, to avoid inefficient resource use, to reduce emissions, to enhance carbon removal, to embrace circularity, to minimize waste, to maximize resource efficiency, to forge a just future, to address challenges, to introduce measures, to counter dangers, to invest in risk reduction, to enforce policies, to promote decent work, to support economic and social goals, to identify gaps, to align decisions with Earth's boundaries, to translate thresholds into practical strategies.
Progress component	nouns/phrases: <i>positive trends, green economy expanding, eco-innovation increasing, improving energy system, significant gains, advancing towards sustainability, improved water use efficiency, immediate benefits, an encouraging sign.</i> verbs/expressions: <i>to improve, to decrease, depletion reversed, withdrawals have started to stabilize; targeted interventions can yield broad,</i>

<i>Components</i>	<i>Examples</i>
	<i>systemic improvements; to remain stable, to show sign of slow recovery, to initiate a process of change, to overcome barriers, to generate options, to have the potential to secure a healthy environment.</i>

CONCEPTUAL MODELLING OF ECOLOGY

