UDC 811.512.133'373.46:81'373.612.2

METAPHORS AND SIMILES IN UZBEK SOIL SCIENCE TERMINOLOGY: A COGNITIVE-LINGUOCULTURAL ANALYSIS

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https://doi.org/10.5281/zenodo.23010216

Abstract.
The article examines metaphorical and simile-based terms of Uzbek soil science terminology from a cognitive-linguocultural perspective. The role of terminological metaphor in the formation and transmission of scientific knowledge is substantiated, and the conceptual metaphors underlying soil science terms are identified: SOIL IS A LIVING ORGANISM, SOIL IS A MOTHER, SOIL IS A LAYERED STRUCTURE, SOIL IS A COVER, SOIL IS MEMORY, SOIL IS WEALTH. Simile-based terms denoting structure, colour and texture are analysed (donador “granular”, yong‘oqsimon “nutty”, prizmasimon “prismatic”, plitasimon “platy”, bo‘z tuproq “serozem, grey soil”, soz tuproq “clay soil”). According to their origin, metaphorical terms are divided into “calque metaphors” and “national-cultural metaphors”, and the connection of the latter group with the gustatory, textile, bodily and household codes of Uzbek culture is revealed.

Keywords: terminological metaphor, simile, conceptual metaphor, soil science terminology, anthropomorphism, cultural code, calque, cognitive terminology, motivation.

Аннотация.
В статье в когнитивно-лингвокультурологическом аспекте исследуются метафорические и основанные на сравнении термины узбекской почвоведческой терминологии. Обосновывается роль терминологической метафоры в формировании и передаче научного знания, выявляются концептуальные метафоры, лежащие в основе почвоведческих терминов: почва – живой организм, почва – мать, почва – многослойное сооружение, почва – покров, почва – память, почва – богатство. Анализируются термины, основанные на сравнении и обозначающие структуру, цвет и механический состав (донадор «зернистая», ёнғоқсимон «ореховатая», призмасимон «призматическая», плитасимон «плитчатая», бўз тупроқ «серозём», соз тупроқ «глинистая почва»). Метафорические термины по происхождению делятся на «кальки-метафоры» и «национально-культурные метафоры»; раскрывается связь второй группы с вкусовым, текстильным, телесным и бытовым кодами узбекской культуры.

Ключевые слова: терминологическая метафора, сравнение, концептуальная метафора, почвоведческая терминология, антропоморфизм, культурный код, калька, когнитивное терминоведение, мотивация.

Аннотация.
Мақолада ўзбек тупроқшунослик терминологиясидаги метафорик ва ўхшатишга асосланган терминлар когнитив-лингвомаданий аспектда тадқиқ этилади. Терминологик метафоранинг илмий билимни шакллантириш ва узатишдаги ўрни асосланиб, тупроқшунослик терминларининг асосида ётган концептуал метафоралар аниқланади: тупроқ – тирик организм, тупроқ – она, тупроқ – қатламли иншоот, тупроқ – қоплам, тупроқ – хотира, тупроқ – бойлик. Структура, ранг ва механик таркибни ифодаловчи ўхшатишга асосланган терминлар (донадор, ёнғоқсимон, призмасимон, плитасимон, бўз тупроқ, соз тупроқ) таҳлил қилинади. Метафорик

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терминлар келиб чиқишига кўра «калька-метафоралар» ва «миллий-маданий метафоралар»га ажратилиб, иккинчи гуруҳнинг ўзбек маданиятидаги таъм, тўқимачилик, тана ва маиший турмуш кодлари билан боғлиқлиги очиб берилади.

Калит сўзлар: терминологик метафора, ўхшатиш, концептуал метафора, тупроқшунослик терминологияси, антропоморфизм, маданий код, калька, когнитив терминология, мотивация.

Introduction. In traditional terminology studies, metaphor was long regarded as a phenomenon alien to scientific language and detrimental to precision. However, the development of cognitive linguistics in the last quarter of the 20th century fundamentally changed this view. G. Lakoff and M. Johnson demonstrated that metaphor is not merely an ornament of speech but a mode of thought, i.e. a mechanism for understanding one conceptual domain in terms of another [1]. R. Temmerman, in her sociocognitive theory of terminology, showed the creative role of metaphor in forming, naming and teaching scientific concepts [4]. In the works of N.D. Arutyunova and E.S. Kubryakova, too, metaphor is interpreted as a cognitive tool that structures knowledge [5; 6].

Soil science is a particularly “favourable” field for metaphorical terms. Soil is a complex, multicomponent and constantly changing natural body that cannot be fully observed with the naked eye. V.V. Dokuchaev defined soil as a distinct natural-historical body formed under the influence of parent rocks, climate, flora and fauna, relief and time [10]. To comprehend and name such a complex object, people turn to familiar domains – notions of the body, family, dwelling, clothing, food and wealth. As a result, metaphorical terms such as tuproq profili (soil profile), ona jins (parent rock, literally “mother rock”), tuproq hayoti (soil life), tuproq nafasi (soil respiration, literally “soil breath”), tuproq charchashi (soil fatigue), tuproq qoplami (soil cover) and tuproq salomatligi (soil health) have formed in soil science terminology.

In Uzbek linguistics, similes and metaphors have been studied comprehensively in the research of N. Mahmudov and D. Khudoyberganova, where similes are regarded as an expression of national-cultural thinking [7; 8]. However, these studies are based mainly on material from literary and colloquial speech, while metaphors and similes in sectoral terminology have not been sufficiently studied. In particular, metaphorical units in Uzbek soil science terminology, their motivational bases and cultural features have not been the subject of a dedicated study.

Research material and methods. The research material comprised Uzbek-language textbooks and study guides on soil science, terminological dictionaries of the field, the “Explanatory Dictionary of the Uzbek Language” [12], and soil science sources in Russian and English [10; 11; 14]. Terms relating to soil classification, soil morphology, soil physics and chemistry, soil genesis and soil conservation were selected, and the method of linguocultural interpretation was applied.

Analysis and results. The analysis revealed that six basic conceptual metaphors are active in Uzbek soil science terminology.

Soil is a living organism. This metaphor is the most widespread and most productive model in soil science terminology. Its scientific basis is that soil is indeed formed as a result of the activity of living organisms (microorganisms, fungi, earthworms, etc.) and is itself a biologically active system. The term tuproq nafasi (soil respiration) denotes the release of carbon dioxide from the soil and the uptake of oxygen, while tuproq hayoti (soil life) denotes the totality of biological processes within it. The term tuproq genezisi (soil genesis; from Greek genesis – “birth, origin”) likens soil formation to the process of birth, and tuproq yoshi (soil age) likens the duration of its development to a human lifespan.

In recent decades, this model has been enriched with new terms. The entry of the term soil health into Uzbek in the form tuproq salomatligi is proceeding naturally, since it corresponds to the notion of “soil as a living being” that has long existed in the consciousness of the Uzbek people. Vernacular expressions such as yer horidi (“the land is exhausted”), yer och qoldi (“the land has gone hungry”), yerni dam oldirmoq (“to let the land rest”) and yerni boqmoq (“to feed the land”) have prepared a ready

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national ground for this model. For this reason, the scientific term tuproq charchashi (soil fatigue) is adopted into Uzbek without any "resistance".

Soil is a mother. The term ona jins (parent rock, literally "mother rock") denotes the rock from which soil is formed. Although this term entered through translation, it harmonizes with the images of ona tuproq ("mother soil") and ona-yer ("Mother Earth") in Uzbek culture and creates a strong cultural resonance. Interestingly, in scientific terminology soil plays the role of the "child" and the rock that of the "mother", whereas in folk culture soil itself is regarded as the "mother". Consequently, one and the same conceptual model operates in different directions in scientific and cultural discourses. The term unumdorlik (fertility) is also originally based on the meaning of giving birth and bearing offspring, and in Uzbek this meaning is preserved through the root unum ("yield, output").

Soil is a layered structure. The terms profil (profile), gorizont (horizon) and qatlam (layer), which denote the vertical structure of soil, and struktura (structure), skelet (skeleton) and g'ovaklik (porosity), which denote its internal organization, are based on conceiving of soil as a structure built in a certain order. The term tuproq skeleti (soil skeleton, i.e. soil particles larger than 1 mm) combines the body and building metaphors at the same time: a skeleton is the "supporting framework" of both a body and a building. These terms are mainly international terms borrowed via Russian, and in Uzbek they are used in parallel with national equivalents such as qatlam (in the sense of horizon).

Soil is a cover. The term tuproq qoplami (soil cover) is based on conceiving of soil as a covering or blanket that "covers" the earth's surface. The Uzbek unit yer po'sti (earth's crust, literally "earth's peel") is likewise based on the image of fruit peel or tree bark. The term qatqaloq (a hard crust that forms on the soil surface after irrigation or rain) was borrowed from the vernacular and recalls the hardened layer on the surface of bread or a thick liquid.

Soil is memory. This model is relatively new and is expressed in modern soil science through the term tuproq xotirasi (soil memory). According to this term, soil "records" and preserves in its properties information about past climate, vegetation cover and traces of human activity [13]. The terms ko'milgan tuproq (buried soil) and paleotuproq (palaeosol) are also understood within this model. In Uzbek culture, images such as ota-bobolar xoki ("the dust of the forefathers") and tuproq qatlamlarida yashiringan tarix ("history hidden in the layers of soil") create a favourable opportunity for "translating" this scientific metaphor into the language of culture.

Soil is wealth. Terms such as yer fondi (land fund), tuproq resurslari (soil resources), gumus zaxirasi (humus reserve), gumus balansi (humus balance) and tuproq boniteti (soil bonitet; Latin bonitas – "quality, goodness") are based on conceiving of soil as wealth with economic value, as capital subject to accounting. This model is consonant with vernacular figurative expressions such as yer – xazina ("land is a treasure") and tuproqdan oltin undirmoq ("to grow gold from soil") and expresses a careful, "proprietorial" attitude towards land.

In soil science terminology, simile-based terms are used particularly widely in soil morphology, i.e. in describing the external features of soil (structure, colour, texture, inclusions). The reason is that soil morphology is based on visually observable features, and the most natural way of naming them is by comparison with familiar objects.

Terms denoting types of structure. Soil structure is the combination of soil particles into aggregates of various shapes and sizes. In Uzbek, types of structure are expressed mainly by simile terms formed with the suffixes -simon ("-like") and -dor ("-having").

Uzbek structure terms are mainly calques of Russian terms in which the source of comparison has been preserved. At the same time, in some cases the source of comparison has been adapted in Uzbek to national-cultural experience. For example, the Russian чешуйчатая ("scaly, like fish scales") structure is rendered in Uzbek as tangasimon. The word tanga in Uzbek means both "small coin" and "fish scale", and this polysemy enhances the imagery of the term. In the term donador (granular), it is noteworthy that don (grain), a key notion of Uzbek farming culture, was chosen as the source domain: for the farmer, the best soil is "grain-by-grain" soil, and from the agronomic point of view this is also the most favourable structure.

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Colour-based terms. The feature of colour plays an important role in naming soil types: qora tuproq (chernozem, “black soil”), bo‘z tuproq (serozem, “grey soil”), qo‘ng‘ir tuproq (burozem, “brown soil”), qizil tuproq (krasnozem, “red soil”) and sariq tuproq (zheltozem, “yellow soil”). These terms are based on colour similarity, and among them the term bo‘z tuproq is of particular linguocultural significance.

The Uzbek word bo‘z originally means “plain hand-woven cotton cloth”. The meaning “whitish-grey” derives from the natural, undyed whitish-grey hue of bo‘z cloth (cf. bo‘z ot – “a grey horse”, bo‘zargan yuz – “a pale face”). Thus, the name of the most widespread soil type in Uzbekistan, bo‘z tuproq, goes back to the textile code. This shows that traces of cotton-growing and textile culture have been preserved in soil science terminology. The Russian term серозём, by contrast, is a simple colour designation and lacks such a cultural “layer”.

Texture-based terms. The mechanical (particle-size) composition of soil is also often named through comparison: the terms yengil tuproq (light soil) and og‘ir tuproq (heavy soil) express the degree of difficulty of tillage by means of a measure of weight. In fact, what is at issue here is not the weight of the soil but the kinaesthetic experience of the effort required to plough it. The terms qumloq (sandy soil), qumoq (loamy soil), soz tuproq (clay soil) and gilli tuproq (clayey soil) are formed on the basis of the name of a constituent. The word soz in the term soz tuproq means both “mud, clay” and “good, well-tuned” in Uzbek. This homonymy may indicate that plastic, mouldable clay was valued in folk consciousness as a “suitable” material in pottery and construction.

The results of the study made it possible to divide metaphorical terms in Uzbek soil science terminology into two groups according to their origin.

Calque metaphors are terms formed by translating metaphorical terms from Russian or other languages: ona jins (parent rock), tuproq qoplami (soil cover), tuproq charchashi (soil fatigue), tuproq xotirasi (soil memory), tuproq salomatligi (soil health), tuproq skeleti (soil skeleton). In these terms, the metaphorical image was not created in Uzbek but adopted “ready-made”. However, the successful adoption of calque metaphors in Uzbek largely depends on their correspondence with images already existing in the national culture. For example, ona jins and tuproq salomatligi were quickly adopted owing to the images of ona tuproq (“mother soil”) and yerni boqmoq (“to feed the land”) in Uzbek culture.

National-cultural metaphors are terms that took shape in the Uzbek vernacular and were later adopted into scientific terminology. The terms in this group are connected with various codes of Uzbek culture:

1) **the gustatory code:** sho‘r tuproq (saline soil), sho‘rxok (solonchak), sho‘rlanish (salinization), sho‘r yuvish (salt leaching) – the amount of salts in the soil is named through the sense of taste;

2) **the textile code:** bo‘z tuproq (grey soil) – the colour feature is expressed through the name of a fabric;

3) **the bodily code:** taqir (takyr; originally “hairless, smooth”, cf. taqir bosh – “a bald head”) – a vegetation-free soil type with a smooth surface is named through a feature of the human body;

4) **the household code:** sho‘r yuvish (salt leaching; the image of washing laundry), qatqaloq (soil crust; a hardened crust), kesak (clod; a hardened lump), yerni dam oldirmoq (to let the land rest; human rest);

5) **the farming code:** donador (granular), lalmi (rain-fed), qo‘riq (virgin land), shudgor (ploughed fallow) – names based on farming experience.

A distinctive feature of the terms in this group is that they have strong motivation and are easily understood and remembered by native speakers. For example, the term sho‘r yuvish (literally “washing out salt”) denotes the process referred to in scientific language as leaching salts from the soil, and as the main winter–spring reclamation measure in Uzbekistan it is familiar to every farmer. In this term, soil is “washed” like soiled fabric, i.e. cleansed of harmful salts. This metaphorical image, having passed from the vernacular into scientific language, has ensured the term’s comprehensibility and wide use.

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Metaphorical terms perform three important functions in the formation and transmission of scientific knowledge. First, the **heuristic function**: a model is borrowed from a familiar domain to name and understand a new scientific phenomenon (for example, the term tuproq nafasi – soil respiration – helps to understand gas exchange in soil as a process of breathing). Second, the **didactic function**: metaphorical terms facilitate the acquisition of complex concepts in the educational process. Third, the **axiological function**: terms such as tuproq salomatligi (soil health), tuproq kasalligi (soil disease) and tuproqni muhofaza qilish (soil conservation) shape a careful and responsible attitude towards soil, i.e. they foster ecological awareness.

At the same time, the limitations of metaphorical terms should also be taken into account. A metaphor may highlight certain features of an object while concealing others. For example, the term ona jins (parent rock) emphasizes the role of rock in soil formation while leaving out factors such as climate, organisms and time. For this reason, precise scientific definitions of metaphorical terms must be provided in terminological dictionaries.

Conclusion. Based on the results of the study, the following recommendations can be made for regulating Uzbek soil science terminology: when adopting new metaphorical terms through calquing, variants consistent with images already existing in Uzbek culture should be chosen; national-cultural metaphors from the vernacular, such as sho‘r yuvish, qatqaloq, taqir, bo‘z and lalmi, should be actively used as synonyms of international terms; and the motivational basis of metaphorical terms should be indicated in explanatory dictionaries of soil science terms.

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