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ПІДХОДИ ТА ПРИНЦИПИ ДОСЛІДЖЕНЬ ГАСТРОНОМІЧНОГО ЛАНДШАФТУ: ОПТИМІЗАЦІЯ, УПРАВЛІННЯ, КАРТОГРАФУВАННЯ

Метою дослідження є картографування гастрономічних ландшафтів українського Правобережного Полісся, тому що виробництво продуктів харчування є важливою системою життєзабезпечення для людей, і забезпечення майбутніх виробничих потужностей, що є ключовим для виживання суспільства, особливо в умовах сьогодення. Дослідження гастрономічних ландшафтів та й ландшафтів взагалі – це міждисциплінарне починання, яке включає підходи та принципи з природничих та соціальних наук, а також гуманітарних наук, ландшафтно-архітектури та мистецтва та ін. Картографування гастрономічних ландшафтів необхідно для створення сталих продовольчих систем, що зумовлює актуальність дослідження.

Методика дослідження гастрономічного ландшафту ґрунтується на поєднанні міждисциплінарних підходів, що дозволяють комплексно оцінити просторові, культурні та економічні аспекти гастрономічної спадщини території та базується на наукових принципах. Оптимізація гастрономічного ландшафту передбачає: виявлення найбільш цінних гастрономічних ресурсів та зон їх концентрації; оцінювання рівня антропогенного навантаження; визначення пріоритетних напрямів розвитку гастрономічного туризму; інтеграцію локального виробництва продуктів у туристичні ланцюги створення вартості. Управління гастрономічним ландшафтом здійснюється на основі: просторового планування; кластерного підходу; партисипативного управління із залученням місцевих громад; брендингу територій і гастрономічних продуктів. Картографування є ключовим інструментом дослідження та управління гастрономічним ландшафтом. Воно передбачає: створення тематичних карт розміщення гастрономічних ресурсів; типізацію гастрономічних ландшафтів; використання ГІС-технологій для аналізу просторових зв'язків; розроблення карт гастрономічних маршрутів і кластерів. Методи дослідження включали загальнонаукові, картографічні та ГІС.

Результати засвідчили можливість створення картосхем гастрономічного ландшафту території дослідження, яка трансформувалася завдяки глобальним сільськогосподарським практикам, спираючись на місцеві природні умови та інфраструктуру (специфічні комбінації біофізичних характеристик, таких як ґрунти, клімат, а також управлінські атрибути, методи обробітку ґрунту, інтенсивність впливу добрив та види сільськогосподарських культур), в яких працюють виробники продуктів харчування тощо.

В роботі *наукова новизна* розкрита через принципи та підходи дослідження гастрономічного ландшафту, через конструктивно-географічні пошуки, землекористування, виробництво продуктів харчування, географічні утворення, які використано як одиниці планування.

Практична значущість дослідження через теоретичні напрацювання та практичні висновки, імплементують зупинку втрати біорізноманіття шляхом виробництва різноманітних продуктів харчування.

Ключові слова: підходи, принципи досліджень гастрономічного ландшафту, картографування, показник інтенсивності використання гастрономічного ландшафту, показник інтенсивності управління гастрономічним ландшафтом, продовольча система, сталий розвиток.

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APPROACHES AND PRINCIPLES OF GASTRONOMIC LANDSCAPE RESEARCH: OPTIMIZATION, MANAGEMENT, MAPPING

The aim of the study is to map the gastronomic landscapes of the Ukrainian Right-Bank Polissya, because food production is an important life support system for people, and ensuring future production capacity is key to the survival of society, especially in today's conditions. The study of gastronomic landscapes and landscapes in general is an interdisciplinary endeavour that incorporates approaches and principles from the natural and social sciences, as well as the humanities, landscape architecture, art, and more. Mapping gastronomic landscapes is necessary for the creation of sustainable food systems, which makes this research particularly relevant.

The methodology for researching the gastronomic landscape is based on a combination of interdisciplinary approaches that allow for a comprehensive assessment of the spatial, cultural and economic aspects of a territory's gastronomic heritage and is based on scientific principles. Optimisation of the gastronomic landscape involves

identifying the most valuable gastronomic resources and areas where they are concentrated; assessing the level of anthropogenic pressure; determining priority areas for the development of gastronomic tourism; and integrating local food production into tourism value chains. Gastronomic landscape management is based on: spatial planning; a cluster approach; participatory management with the involvement of local communities; branding of territories and gastronomic products. Mapping is a key tool for researching and managing the gastronomic landscape. It involves: creating thematic maps of gastronomic resources; typifying gastronomic landscapes; using GIS technologies to analyse spatial relationships; developing maps of gastronomic routes and clusters. The research methods included general scientific, cartographic and GIS methods.

The results demonstrated the possibility of creating maps of the gastronomic landscape of the study area, which has been transformed by global agricultural practices, based on local natural conditions and infrastructure (specific combinations of biophysical characteristics such as soil, climate, as well as management attributes, soil cultivation methods, fertilizer intensity, and crop types) in which food producers and others operate.

The scientific novelty of the work is revealed through the principles and approaches of researching the gastronomic landscape, through constructive-geographical research, land use, food production, and geographical formations, which are used as planning units.

The practical significance of the study, through theoretical developments and practical conclusions, is to implement measures to halt biodiversity loss through the production of a variety of food products.

Keywords: approaches, principles of gastronomic landscape research, mapping, indicator of gastronomic landscape use intensity, indicator of gastronomic landscape management intensity, food system, sustainable development.

Relevance and scope of the study. The integration of landscape approaches and principles into regional, urban, and rural planning policies is one of the main objectives of the European Landscape Convention. In the twenty-first century, traditional spatial organization of territories has gradually incorporated two types of practices related to the landscape approach: nature-based strategies that focus on sustainable goals; and people-based strategies that integrate the social dimension into decision-making processes. Currently, geographical differences in landscape studies offer a new definition of landscape, from which new directions for its study emerge, repositioning the concept of gastronomic landscape as central to the rapidly changing global gastronomic landscapes of food production.

At least in Western scientific communities, landscapes are viewed as a combination of natural and cultural aspects, where nature (i.e., in the form of wildlife and more) and culture (i.e., in the form of ideas) are opposite poles between which the perception and experience of landscape occurs. Currently, we find this idea appealing and believe it provides a scientific basis for approaches and principles for researching the gastronomic landscape.

Innovative conceptual and empirical work is being carried out in the academic environment – the visualization of gastronomic landscapes against the backdrop of a physical-geographical basis. Spatial diagnostics will allow us to identify certain classes of gastronomic landscapes in the study area.

A gastronomic landscape is a geographical component of the global food system that combines production systems and places that spatially represent the global food system.

By identifying and documenting gastronomic landscapes that underlie local food systems but can occur on a global scale in comparable forms, science can bridge the gap between abstract solutions and local needs and formulate ways to increase food production worldwide. This, in principle, allows knowledge and approaches to sustainable management to be transferred from one place to another, and is one of the key advantages of such a foodscape typology system.

The global results of sustainable land use actions depend largely on which geographical objects we use as planning units. But is sustainability best determined at the field, farm, community, national, or macro-regional level? Using the concept of the gastronomic landscape, we are trying to find a geographical definition of the intersection between sustainable food systems and land use planning. The transformation of food systems is used as a central solution for achieving sustainable development goals for climate and biodiversity.

Global food systems are multiscale in nature, as they consist of complex and local, integrating dynamic flows of seeds, agricultural practices, social customs, consumers, gastronomic tastes, ethnic groups, biosphere regulation models, and sustainable development policies.

This, in principle, allows knowledge and approaches to sustainable management of gastronomic landscapes to be transferred from one place to another, and is one of the key advantages of such a foodscape typology system (Ratnayaka, 2025, Yoo, 2022, Zareimanesh, 2022).

A number of international documents confirm the relevance of our research: The report of the International Panel of Experts on Sustainable Food Systems (IPES-Food) “From Uniformity to Diversity:

A Paradigm Shift from Industrial Agriculture to Diversified Agroecological Systems” (2016) calls for a transformation of global food systems. The report clearly shows that such a global transformation will require more than “adjusting business as usual” and must also include attention to poverty, access, social equity, and power. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Assessment Report on Land Degradation and Restoration (2018) emphasizes the urgency of action and calls for changes in production and consumption to prevent the worst effects of land degradation. The publication identifies agricultural expansion as the most immediate driver of land degradation and proposes a landscape approach.

The EAT-Lancet Commission on Food, Planet, Health report, Food, Planet, Health (2019), and its companion paper in Nature Food (2020) identify food as the single most powerful lever for optimizing human health and environmental sustainability on Earth. This report provides a framework for global healthy diets with regionally adapted targets and outlines the impact of combined diets, food waste, and production system improvements on climate and land use. The report also proposes five strategies for achieving the best-case scenario, including changing diets, reorienting agricultural policy towards healthy food production, sustainable intensification, land and ocean management, and halving food waste.

The Food and Land Use Coalition (FOLU) report, Growing Better: Ten Critical Transitions for Food and Land Use Transformation (2019) sets out an agenda for reforming food systems that “will enable food and land use systems to provide food security and healthy diets for a global population of over 9 billion by 2050, while also addressing climate, biodiversity, health, and poverty challenges.”

Nature-based solutions include three of the critical transitions described in this report.

The report by the Paulson Institute, The Nature Conservancy, and Cornell's Atkinson Centre for Sustainable Development, "Financing Nature: Closing the Global Biodiversity Finance Gap (2020) emphasizes the need to transform current economic models and market systems by redirecting capital to incentivize nature conservation and restoration. The report calls for reforming harmful production subsidies, particularly in agriculture and fisheries – the two largest drivers of global biodiversity loss – and offers pathways for governments to reform these existing subsidies while supporting sustainable agriculture and fisheries practices to help ensure a net positive effect on biodiversity.

Thus, by mapping the world's gastronomic landscapes, their current state is assessed (Bossio, Obersteiner, 2021). It examines the threats they face and the opportunities that exist through nature-based solutions to transition to a food system that can meet demand while preserving biodiversity.

The scientific perception and definition of gastronomic landscapes has not been a topic of discussion within the scientific community, but there is a growing need for research focused on integrating this information into cultural heritage and planning practices. The purpose of this article is to demonstrate, using a practical example, how this can be done with the help of GIS programming. In this study, the landscape approach and mapping methodology were adapted to the specific region under study – the Right Bank Polissia of Ukraine. The results of the mapping will show local cultural heritage, ethnographic features, soil science practices, ethnic food traditions, local terroirs, and specialties as relevant sources for future potential strategies for spatial planning of the gastronomic landscape.

International scientific research considers “cultural mapping” to be an ethnographic method. Like many anthropological ideas (and, in fact, the very concept of “culture”), this methodology has become more widely used. UNESCO (2009) uses it, as do many local community projects. Cultural mapping “toolkits” are now available, as well as newsletters and websites designed to help people use them (Bon, Tomkins, 2024). However, here we refer to cultural mapping as a scientific method for the systematic collection of social data (Zhou, 2022, Zulmi, 2022). Cultural mapping explores people's historical and contemporary relationships with their local environment. This involves “walking” with informants in places they consider important and collecting social, historical, and environmental data on the spot.

It states that places not only reflect the physical materialization of cultural beliefs and values, but also serve as repositories and practical mnemonics for information. Thus, this process is simultaneously an exercise that allows for the collection of basic data about the territory; engaging and observing people's interactions with places; a process of discovery that allows informants to formulate cultural landscapes and territorially located ethnohistories embedded into the physical topography; and a process of collaboration that shapes cultural perceptions of the territory. Interviewing informants “on site” draws on both empirical and abstract forms of knowledge, and the use of “walks” provides a relaxed and productive context for interviews.

Cultural mapping produces representations that can be explored in various ways and can also be viewed as a collaborative process. In this sense, it can include all three types of activities that Banks and

Morphy refer to as “visual research methods”: creating visual representations; analyzing existing representations; and jointly producing visual representations (Banks, Morphy, 1997). Visual media are becoming an increasingly important part of ethnographic research (Pink, 2006). In addition to creating spatial representations, cultural mapping is often complemented by photography, video and files, GIS databases, digital and hypermedia.

It is evident that certain theoretical and methodological tools need to be developed in the field of mapping gastronomic landscapes.

Sources and Methods. Four approaches define the scientific field within which the gastronomic landscape is perceived and in which various scientific principles can be located. The study of the gastronomic landscape is based on the following approaches: spatial, systemic, socio-cultural, and behavioural.

The measurement of the gastronomic landscape that we have defined can be placed in the field of approaches in relation to each other. They intersect and are subject to certain principles: co-evolution; dynamic evolution; identity and sense of place; sustainable management and nature conservation.

A gastronomic landscape is a land or water area of food production defined by a number of different biophysical characteristics and management patterns that can be mapped. They cover all parts of the globe where food is produced. When mapped, they form a mosaic at the subnational level across the globe. We based our work on the results of the first global analysis and mapping of gastronomic landscapes (Bossio, Obersteiner, 2021).

Some gastronomic landscapes are found in relatively small, limited areas, while others are widespread and found on several continents. Examples of the latter include semi-arid grazing systems, which are found on all continents, and “breadbasket” gastronomic landscapes with intensive production of cereals and oilseeds on temperate plains with good soils. As expected, foodscapes are highly diverse, and global mapping has led to the identification of more than 80 classes of foodscapes (Bossio, Obersteiner, 2021) (Figs. 1, 2).

Overall, the foodscape classification demonstrates the diversity of production systems around the world (Ratnayaka, R, 2025). Despite the relatively coarse resolution, which has undoubtedly simplified the enormous diversity found in food production areas around the world, the analysis identified more than 80 different classes of foodscapes (Fig. 1).

Some of these classes occur in fairly small geographic areas. An additional 30% of land area is classified as having little or no food production.

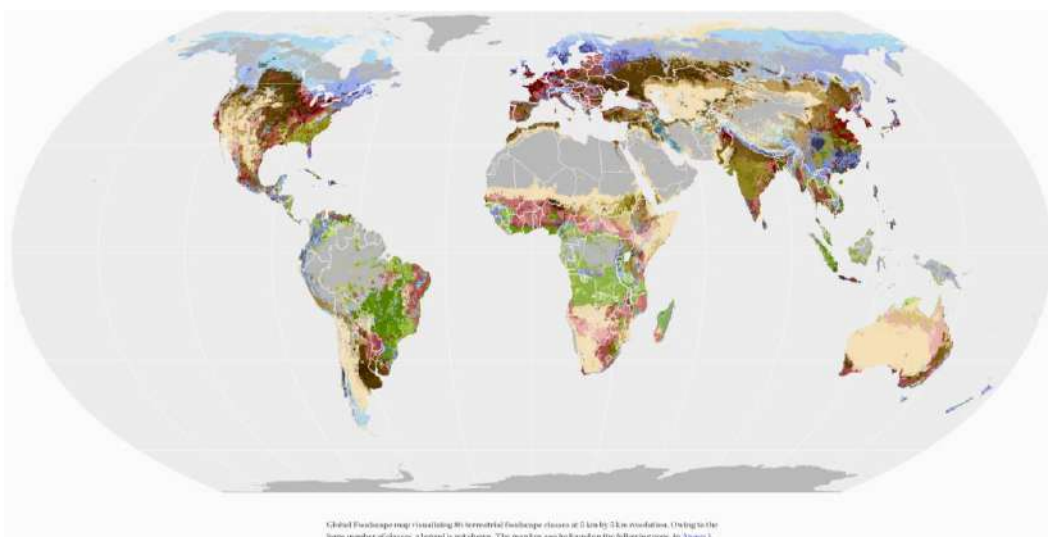


Fig. 1. Map of the world's gastronomic landscapes (Bossio, Obersteiner, 2021)

These territories range from forest landscapes to deserts and arctic tundra, and also include some of the most densely urbanized lands in the world. Although classified as “non-food production” in this global analysis, they include some forms of production such as hunting, gathering, and low-intensity agriculture, often by indigenous peoples, as well as urban agriculture.

Gastronomic landscapes can be important for food security and dietary diversity for local communities, highlighting the need for diverse approaches to scaling up interventions, including nature-based solutions.

Gastronomic landscapes can be important for food security and dietary diversity for local communities, highlighting the need for diverse approaches to scaling up interventions, including nature-based solutions.

AREAS WITH LITTLE OR ONLY SUSTAINABLE FOOD PRODUCTION	MOLUSSOLS IN MOUNTAINOUS BARE AREAS WITH LITTLE CROP PRODUCTION AND GRAZING	ALPICOLES IN PLAINS AND GRASSLANDS WITH LITTLE CROP PRODUCTION AND GRAZING	DECIDUOS ON HUMID TREE-COVERED LAND WITH LITTLE FOOD PRODUCTION
ENTSOLOS ON PLAINS WITH BARE LAND, LITTLE FOOD PRODUCTION AND GRASS COVER	MOLUSSOLS IN MOUNTAINOUS HILLY AREAS WITH LOW DENSITY LIVESTOCK GRAZING AND SCATTERED CROP PRODUCTION	ALFOSOLS IN SHRUBBERY PLAINS THAT ARE GRAZED WITH SCATTERED CROPLAND	OXISOLOS AND ULTISOLOS ON HUMID TREE-COVERED LAND WITH SCATTERED CROPLAND AND LIVESTOCK
ENTSOLOS ON PLAINS WITH GRAZED BARE LAND AND GRASS COVER	MOLUSSOLS IN MOUNTAINOUS HILLY CULTIVATED LAND WITH GRAZING RUMINANTS AND RAINFED MIXED CROPS	ALFOSOLS IN MIXED FOOD PRODUCTION LANDSCAPES WITH SCATTERED GRAZING	OXISOLOS AND ULTISOLOS ON HUMID HILLY TREE-COVERED LAND WITH AGROFORESTRY AND SOME LIVESTOCK
ENTSOLOS ON PLAINS WITH BARE LAND AND SCATTERED MIXED CROP PRODUCTION AND LOW NUTRIENT APPLICATION RATE	MOLUSSOLS IN HILLY CONVENTIONALLY TILLAGED CULTIVATED LAND WITH INTERSPERSED GRAZING	ALFOSOLS IN MIXED DIVERSE CROP SYSTEMS ON SMALL FIELDS WITH SOME LIVESTOCK AND AGROFORESTRY AND LOW NUTRIENT APPLICATION RATES	OXISOLOS AND ULTISOLOS ON HUMID TREE-COVERED LAND WITH DIVERSE SMALL FIELD PRODUCTION AND AGROFORESTRY
ENTSOLOS ON DRY PLAINS AND LARGE CULTIVATED FIELDS AND LIVESTOCK	MOLUSSOLS AND INCEPTISOLOS IN PLAINS WITH IRRIGATED INTENSIVE CROP PRODUCTION	ALFOSOLS WITH MIXED CROP PRODUCTION, SOME RUMINANTS, AND HIGH-NUTRIENT APPLICATION RATES	OXISOLOS AND ULTISOLOS WITH RAINED PERENNIAL CROPS AND AGROFORESTRY AND SOME LIVESTOCK
ENTSOLOS ON DRY RAINED PLAINS WITH LEGUMES AND PULSES PRODUCTION AND OCCASIONALLY OTHER CROPS	MOLUSSOLS IN PLAINS WITH INTENSIVE IRRIGATED CEREAL AND OIL CROP PRODUCTION AND HIGH-NUTRIENT APPLICATION RATES	ALFOSOLS WITH RAINED CROP PRODUCTION ON LARGE FIELDS WITH SOME LIVESTOCK	OXISOLOS AND ULTISOLOS WITH MIXED GRAZING AND CROP PRODUCTION ON LARGE FIELDS
ENTSOLOS ON DRY PLAINS AND BARE LAND WITH MIXED IRRIGATED CROP PRODUCTION	MOLUSSOLS IN INTENSIVE RAINED CEREAL AND OIL CROP PRODUCTION LAND WITH HIGH NUTRIENT APPLICATION RATES	ALPICOLES WITH RAINED DIVERSE CROP PRODUCTION WITH SOME LIVESTOCK	OXISOLOS AND ULTISOLOS WITH RAINED PERENNIAL CROPS AND AGROFORESTRY AND HIGH-NUTRIENT RATES AND LIVESTOCK
ENTSOLOS ON DRY PLAINS AND BARE LAND WITH IRRIGATED VEGETABLE PRODUCTION AND HIGH NUTRIENT APPLICATION RATES	MOLUSSOLS IN PLAINS WITH INTENSIVE RAINED LARGE FIELD WITH CEREAL AND OIL CROP PRODUCTION	ALPICOLES WITH IRRIGATED INTENSIVE MIXED CROP PRODUCTION AND RUMINANTS	OXISOLOS AND ULTISOLOS ON LAND WITH HUMID RAINED AND IRRIGATED PERENNIAL PRODUCTION AND OTHER MIXED CROPS AND LIVESTOCK
INCEPTISOLOS ON HUMID HILLY TREE-COVERED LAND WITH SCATTERED CROP PRODUCTION	MOLUSSOLS IN PLAINS WITH INTENSIVE RAINED CEREAL AND OIL CROP PRODUCTIONS LAND THAT IS SINGLE-CROPPED	ALFOSOLS WITH MIXED IRRIGATED INTENSIVE CEREAL PRODUCTION AND LIVESTOCK WITH HIGH NUTRIENT APPLICATION RATES	OXISOLOS AND ULTISOLOS ON HUMID IRRIGATED INTENSIVE PERENNIAL PRODUCTION AND OTHER MIXED CROPS AND LIVESTOCK
INCEPTISOLOS ON HUMID MOUNTAINOUS LAND WITH TREE COVER AND SCATTERED MIXED CROP PRODUCTION	VERTISOLOS IN PLAINS WITH GRAZED SHRUBBY LAND AND SCATTERED MIXED CROP PRODUCTION	ALFOSOLS WITH RAINED INTENSIVE CEREAL PRODUCTION AND LIVESTOCK WITH HIGH NUTRIENT APPLICATION RATES	ULTISOLOS ON HUMID TREE-COVERED LAND WITH LITTLE CROP PRODUCTION
INCEPTISOLOS ON HUMID HILLY-MOUNTAINOUS WITH TREE COVER AND SMALL FARMED MIXED AND INTENSIVE DIVERSE PRODUCTION	VERTISOLOS IN PLAINS OVERSEVERLY CULTIVATED LAND AND INTERSPERSED GRAZING	ANDISOLOS ON BARE LAND WITH LITTLE CROP PRODUCTION	ULTISOLOS ON HUMID TREE-COVERED LAND WITH SCATTERED CROP PRODUCTION
INCEPTISOLOS ON HUMID FORESTED HILLS WITH INTENSIVE MIXED CROP PRODUCTION AND GRAZING	VERTISOLOS IN PLAINS WITH MIXED CROP AND LIVESTOCK PRODUCTION	ANDISOLOS ON HILLY LAND WITH LITTLE CROP PRODUCTION	ULTISOLOS ON HUMID TREE-COVERED LAND WITH SCATTERED CROP PRODUCTION ON LARGE FIELDS
INCEPTISOLOS ON HUMID HILLY MIXED TREE-COVERED LAND WITH RAINED PERENNIAL CROPS AND OTHER LIVESTOCK	VERTISOLOS IN PLAINS WITH MIXED IRRIGATED AND RAINED PRODUCTION WITH MIXED CROP PRODUCTION	ANDISOLOS ON HILLY AND MOUNTAINOUS LAND WITH SPARSE CROP PRODUCTION AND RUMINANTS	ULTISOLOS ON HUMID TREE-COVERED LAND WITH DIVERSE CROP PRODUCTION
MIXED RAINED HIGHLY PRODUCTIVE LAND WITH AGROFORESTRY AND DIVERSE CROPS	VERTISOLOS IN PLAINS WITH RAINED INTENSIVELY CULTIVATED LAND WITH MIXED PRODUCTION AND SPARSE GRAZING	ANDISOLOS ON HILLY TREE AND SHRUBLAND WITH SCATTERED CROP PRODUCTION	ULTISOLOS ON HILLY AND MOUNTAINOUS TREE-COVERED LAND WITH DIVERSE CROP PRODUCTION AND HIGH-NUTRIENT APPLICATION RATES
INCEPTISOLOS ON HUMID LAND WITH INTENSIVE MIXED PERENNIAL TREE CROPS AND NON-RUMINANT GRAZING	VERTISOLOS IN PLAINS WITH LARGER-INTENSIVELY CULTIVATED FIELDS WITH REDUCED TILLAGE	HISTOSOLS AND SPodosOLS ON WET MOUNTAINOUS LAND WITH LITTLE CROP PRODUCTION	ULTISOLOS WITH MIXED CROP AND LIVESTOCK PRODUCTION AND HIGH NUTRIENT APPLICATION RATES
INCEPTISOLOS ON HUMID HILLY LAND WITH INTENSIVE MIXED LIVESTOCK AND OTHER CROPS GROWN WITH HIGH-NUTRIENT APPLICATION RATES	INCEPTISOLOS ON BARE GRASSY LAND WITH SCATTERED GRAZING	SPodosOLS ON HILLY TREE-COVERED LAND WITH SCATTERED CROP PRODUCTION	ULTISOLOS ON HUMID TREE-COVERED LAND WITH DIVERSE CROP PRODUCTION AND SOME LIVESTOCK
MIXED URBAN AND PER-URBAN AREAS WITH SOME AGRICULTURE AND LIVESTOCK	INCEPTISOLOS ON MIXED FOREST AND GRASSLAND	HISTOSOLS AND SPodosOLS WITH RAINED MIXED CROP PRODUCTION AND LIVESTOCK INCLUDING RUMINANTS	ULTISOLOS WITH MIXED CROPS INCLUDING PERENNIALS AND LIVESTOCK PRODUCTION
PER-URBAN AREAS WITH MARGINAL AGRICULTURE AND LIVESTOCK	INCEPTISOLOS IN HILLY GRASSY LAND WITH SCATTERED GRAZING AND MARGINAL CROP PRODUCTION	HISTOSOLS AND SPodosOLS IN TREE-COVERED LANDSCAPES WITH SCATTERED CROP PRODUCTION ON LARGE FIELDS	ULTISOLOS WITH INTENSIVELY CULTIVATED RAINED AND IRRIGATED MIXED CROP AND LIVESTOCK PRODUCTION AND HIGH NUTRIENT APPLICATION RATES
PER-URBAN AREA INTERSPERSED WITH INTENSIVE IRRIGATED AGRICULTURE AND LIVESTOCK	INCEPTISOLOS IN MOUNTAINOUS BARE LAND WITH SMALL FIELDS AND TRADITIONAL TILLAGE	HISTOSOLS AND SPodosOLS ON MOUNTAINOUS LAND WITH GRAZING AND INTERSPERSED FOOD PRODUCTION	
	INCEPTISOLOS IN FORESTED LAND WITH/LOW SCATTERED LARGE FARMS AND LOW CROP DIVERSITY	HISTOSOLS AND SPodosOLS ON HILLY TREE-COVERED LAND GRAZED AND CULTIVATED WITH HIGH NUTRIENT APPLICATION RATE	
	INCEPTISOLOS IN HILLY LAND WITH MIXED PRODUCTION OF CONVENTIONAL TILLAGE AND HIGH NUTRIENT APPLICATION	HISTOSOLS AND SPodosOLS ON INTENSIVELY CULTIVATED LAND WITH HIGH LIVESTOCK PRODUCTION	
	INCEPTISOLOS IN ARID-HILLY LAND WITH RAINED CEREAL AND LEGUME PRODUCTION AND OTHER LIVESTOCK	SPodosOLS ON INTENSIVELY CULTIVATED AND HIGH LIVESTOCK PRODUCTION AND NUTRIENT APPLICATION RATE	
	INCEPTISOLOS IN HILLS AND MOUNTAINS WITH IRRIGATED INTENSIVE MIXED CROP PRODUCTION		
	INCEPTISOLOS IN HILLY SHRUBLAND WITH IRRIGATED INTENSIVE MIXED CROP PRODUCTION AND HIGH-NUTRIENT APPLICATION		

[illegible]

Targeted intervention and understanding of natural resource potential and nature-based solutions in food systems requires analysis that is sensitive to the distribution of both biogeographical conditions and current use and management. For this reason, the analysis in this study began with an attempt to map and classify the food landscapes of the study area.

It is worth highlighting the classes of gastronomic landscapes of the Ukrainian Right-Bank Polissia based on the indicator of the intensity of use of the gastronomic landscape (hereinafter referred to as

PIVGL) and the indicator of the intensity of management of the gastronomic landscape (hereinafter referred to as PIUGL).

The indicator of the intensity of use of the gastronomic landscape is calculated using formula (1.1):

$$PIVGL = \frac{Pw}{Pos+Npr+Pz+Pg+Pk+Pc+Qpx}, \text{ where} \quad (1.1.)$$

Pw – total area; Pos – arable land area; Npr – nutrient application rates (per 1 ha); Pzo – area of irrigation/drainage; Pg – area of agricultural product processing facilities; Pk – area of enterprises engaged in the sale and distribution of food products; Pc – area of catering establishments; Qpx – cattle density (in livestock units per 1 ha).

Various geographical features form the basis for food production. These include soil composition, climate, topography, land cover, access to fresh water, and the quality of the seabed. It is therefore important for us to study the natural resource potential of the gastronomic landscape of the region under investigation.

Identifying and mapping the gastronomic landscape makes it easier to understand which natural solutions are most relevant for the transition it will need to make in order to meet demand, preserve ecosystems and the services they provide, and reduce greenhouse gas emissions.

The layers on the map included: the first – physical geography – soil composition, climate, topography, land cover;

The second layer – management models – methods that producers use to grow food, such as irrigation methods, tillage, or nutrient input levels;

The third layer – socio-economic influences – this layer zooms out to contextualize the gastronomic landscape, including market forces, distribution issues, government policy, local communities, and cultures.

These layers overlap, creating a gastronomic landscape. A gastronomic landscape is a specific area of food production defined by a combination of biophysical characteristics and management attributes in that area.

Global gastronomic landscapes have contributed to steady growth in food production during decades of population growth and dietary evolution. However, there are significant obstacles. Climate change and related natural disasters – droughts, fires, floods, pests and disease outbreaks – threaten the sustainability of the world's gastronomic landscapes.

At the same time, the ways in which gastronomic landscapes are managed or mismanaged have numerous consequences for food production and the environment. Food production is paradoxical: it depends on a healthy environment, but at the same time is a powerful driver of environmental degradation.

Therefore, it is worth introducing an indicator of the intensity of gastronomic landscape management (hereinafter referred to as PIULM), which is calculated using the formula (1.2):

$$PIULM = PIVGL + Lpx + Te + Em, \text{ where} \quad (1.2)$$

$PIVGL$ – indicator of the intensity of use of the gastronomic landscape; Lpx – number of people employed in food production and processing (thousands); Te – number of people employed in food sales and disposal (thousands); Em – number of agricultural enterprises, firms, and administrations.

Research results and discussion. Each individual gastronomic landscape is a basic unit on which a multidimensional analysis can be built. Since each class of gastronomic landscape represents a combination of biophysical and management variables, it allows similar elements to be grouped together and identifies differences that affect the potential of various interventions. Thus, it can be expected that specific practices identified as suitable in a particular location within a gastronomic landscape class will be widely applied in that gastronomic landscape class, although the socio-political and cultural context may make their adoption more or less likely. According to the world map of gastronomic landscapes (Figs. 1, 2), the study area is characterized by the following classes of gastronomic landscapes: ultisols – filled with clay soils that are low in organic matter, high in acidity, and characteristic of humid regions. Ultisols – 4 gradation – of the Right Bank Polissia of Ukraine are characterized by wet, soddy soils with low production, scattered crops, scattered production on large fields, and diverse crop production.

There are small areas of alfisols – 1-4 gradation, on plains with meadows with small grazing of farm animals, on shrubby plains with scattered agricultural land, in landscapes of food production with scattered agricultural land, in mixed systems of agricultural fields with some livestock, agroforestry, and production of nutrients.

Gastronomic landscapes are distinguished based on a specific combination of biophysical and management-related variables. To make the identification, the best available global spatial datasets (with a

resolution of 5 km by 5 km) on the biophysical and management properties of terrestrial food production systems as they exist today were collated and interpreted.

Food production is one aspect of the gastronomic landscape, but there are other aspects and uses, including natural and urban areas, that should be taken into account.

Thus, the following classes of gastronomic landscapes of the Ukrainian Right-Bank Polissia have been identified:

- high-intensity food production class;
- medium-intensity food production class;
- low-intensity food production class.

The calculation was performed using formula (1.3).

$$KGL = PCH + PQ + PG + PJ + PF + PO + PV + Pi, \text{ where} \quad (1.3)$$

PCH – area sown with agricultural crops (oats, rye, wheat, barley); PQ – area sown with fodder and sugar beets, corn; PG – area sown with flax; PJ – area sown with peliushka, clover; PF – areas of vegetable crops (cabbage, cucumber, radish, beans); PO – areas of fruit crops (pear, apple, cherry, peach); PV – potatoes, Pi – rapeseed, soybeans, corn.

The resulting clusters of gastronomic landscapes range from highly intensive to low-intensive gastronomic landscapes.

In turn, the classes of gastronomic landscapes are divided into groups according to the PIVGL indicator:

- areas with small-scale agricultural production;
- areas with scattered agricultural land and pastures;
- mixed areas of agricultural land and pastures;
- areas of intensive agricultural production.

Gastronomic landscapes allow for flexible definition of individual units of analysis and management for research and action. The gastronomic landscape overlaps with clear supply chains, forming a mosaic within political units and local communities, and also overlaps with agroecological zones and biomes, physical-geographical zones. This means that for local communities, the gastronomic landscape can become a spatial unit for mapping and a path to transformation and sustainable development.

Against the backdrop of the gastronomic landscape, a food system is developing. It is a complex network that shapes this activity related to production and consumption, food utilization, and directly to management, clearly reflecting the indicator of the intensity of gastronomic landscape management (hereinafter referred to as ILGM).

The basis for the development of food systems in the study area is the soil cover. The Right Bank Polissia region of Ukraine is characterized by sod-podzolic soils, which are acidic soils with low humus content. Sod-gley soils have a high humus content, while sod-carbonate soils have an average humus content and neutral pH values.

Now, more than ever, it is time to prioritize not only our health, but also the quality of life for ourselves, our communities, and our families in this global effort to revive the earth's soil. The soil cover of the Right Bank Polissia region of Ukraine is quite diverse. This is due to the humid and mild climate, the wide variety of chemical and granulometric composition of soil-forming rocks, well-developed mesorelief and micro-areas located on flat terrain, varying groundwater levels, diverse plant formations, and varying intensities of human economic activity. Soil-forming rocks have a predominantly light granulometric composition and are represented by sandy, clayey-sandy, sandy loam, and light loam water-glacial, glacial, and alluvial deposits. Occasionally, chalk and marl spots are harbingers of massive crystalline rocks in the relief. In some places of the Right-Bank Polissia of Ukraine, loess deposits are widespread in small islands. One of the largest is the Slovechansko-Ovrutsky Ridge. The great diversity of soil-forming rocks, their granulometric and mineralogical composition, and complex meso- and micro-relief are the reasons for different moisture conditions. Significant waterlogging and rich and diverse vegetation cover have led to the formation of a very complex soil cover in the Right-Bank Polissia.

The latter forms complex complexes and mosaics in most areas and is characterized by small contours (the average size of soil contours ranges from 20 to 50 hectares). Sod-podzolic and sod-medium podzolic soils prevail in Polissia. They occupy about 60% of the area (Polupan, 2005). Due to the poor drainage of the territory and the close occurrence of groundwater, about 60% of podzolic soils are clayey and loamy. The second place in terms of area (about 20%) is occupied by meadow and soddy soils, which are widespread on the floodplains of rivers, in separate slightly sloping depressions on the floodplains and watersheds. Peat bogs and peat-gley soils occupy third place in terms of area (10%). They are found on

river floodplain terraces and the bottoms of passable valleys, mainly of lowland and, less frequently, transitional types. A small area (1–1.5%) is occupied by sod-carbonate soils developed on chalk rocks, and almost the same amount is occupied by grey and light grey podzolic soils, which are widespread on loess islands. These are some of the best soils in the Right-Bank Polissia. Overall, in the structure of the soil cover, 48.0% of the agricultural land in the zone is represented by sod-podzolic soils, 13.9% by light grey, grey forest, dark grey, and partially podzolized black soils, 14.6% by sod-gley soils, and 6.0% by peat bogs and peatlands (Polupan, Solovey, Vylchko, 2005).

The composition of land is characterized by a significant proportion of arable land, accounting for 49.6%. The physical and geographical area of Volhynia Polissia is represented by sod-carbonate soils, which are built on chalk weathering products: marl and chalk. They are mainly found in the southern and south-western parts of the physical-geographical region. The percentage of humus is 3-12%. The physical-geographical region of Zhytomyr Polissia is represented by gray forest soils. They are concentrated in the southern part and in the north on the Slovechansko-Ovrutsky Ridge.

The cultivated areas of agricultural crops in the Zhytomyr region include the following list: in the north – rye (*Secale cereale*), oats (*Avena*), fodder beet (*Beta vulgaris* L. v. *crassa*), potatoes (*Solanum tuberosum*), triticale (\times *Triticosecale*), seradella (*Ornithopus* L.), field pea (*Pisum arvense* L.). A new addition is blueberry (*Vaccinium corymbosum* L.); in the central part – potato (*Solanum tuberosum*), long-stemmed flax (*Linum usitatissimum* L. f. *Elongata*), curled flax (*Linum humile* Mill.), clover (*Trifolium pratense*), peas (*Pisum*); in the south – wheat (*Triticum aestivum* L.), sunflower (*Helianthus annuus*), cabbage (*Brassica*), sugar beet (*Beta vulgaris* L. var. *altissima*), raspberry (*Rubus idaeus*), fruit and vegetable products: pear (*Pyrus communis* L.), apple (*Malus domestica*), peach (*Prunus persica*) – fruit and vegetable products, millet (*Panicum*), corn (*Zea mays*), soybean (*Glycine max* Moench), lupine (*Lupinus*), vetch (*Vicia*). Kyiv region identical crops, but there are niche crops: chickpea (*Cicer arietinum*), amaranth (*Amaranthus* L.), beans (*Phaseolus*). Rivne and Volyn regions in the north blueberry (*Vaccinium corymbosum* L.); perennial agricultural crops for hay and grazing (up to 20 species of cock's foot (*Dactylis glomerata*), red clover (*Trifolium pratense*), alfalfa (*Medicago*), etc.), peas (*Pisum*). South – wheat (*Triticum aestivum* L.), sugar beet (*Beta vulgaris* L. var. *altissima*), mustard (*Brassica (Sinapis)*), rapeseed (*Brassica napus* L.), cabbage (*Brassica*), radish (*Raphanus sativus* var. *radicula* Pers.), potatoes (*Solanum tuberosum*), soybeans (*Glycine max* Moench), barley (*Hordeum vulgare* L.).

The natural resource potential of the Ukrainian Right-Bank Polissia allows us to distinguish the gastronomic landscape, taking into account the indicators of the intensity of use of the gastronomic landscape and the intensity of management of the gastronomic landscape.

Conclusions. A gastronomic landscape is a geographical location characterized by a clear combination of food production management characteristics and biophysical attributes of the broader terrestrial and marine landscapes into which it is embedded. The gastronomic landscape as a whole encourages an integrated perspective, and mapping the gastronomic landscape based on globally available datasets provides a spatially clear platform for interventions.

Soil with food practices and biodiversity, as a landscape resource, is valued not only for its own sake, but also for its ability to generate cultural heritage development, which helps to increase sources of income in rural areas and raise the income and employment levels of the local workforce (especially women).

Generalized data on biodiversity in the Ukrainian Right-Bank Polissia region from the late 19th century to the early 21st century showed that the list of regionalized agricultural crops has remained virtually unchanged. Only rapeseed and soybeans are appearing in modern crop rotation and industrial crops such as flax, hops, and hemp almost disappearing. Horticulture and gardening are developing both in households and on a larger scale in large private farms. Farms have taken the lead from households in animal husbandry, pond fish farming, and beekeeping. Hunting, forest berries, and mushrooms are an important addition to the diet of Polissia residents. The gastronomic landscape is linked to sustainable agriculture and a stable food system, which is not only an economic lever but also a form of protection for the soil in the study area, which is fragile and at risk in the current military conditions.

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