

# Biodiversity Mainstreaming Call or Fall? Evidence of Strategic and Agriculture-Specific Policy in Ukraine

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## ABSTRACT

Biodiversity mainstreaming (BM) call is a part and parcel of a comprehensive global sustainability policy, and national efforts are to complete its whole puzzle. Assessment of BM progress in a national context discloses country-specific actions towards BM, allowing to identify and generalize sources of fallouts in this field. This paper assesses the BM progress across Ukrainian strategic and agriculture-specific policy. To answer the question about the real ability of emerging legislation to make the BM call viable, we applied quantitative assessment of biodiversity issues inclusion, content analysis and qualitative review. Results testify the failure of the biodiversity mainstreaming when it comes to the clear problem recognition, correspondence of used terminology, and coherence of goals-measures-outcomes- monitoring. Ukrainian evidence lays bare on problems relevant for other developing countries, highlighting the need to rethink the future composition and tools of global biodiversity protection policy with emphasis on developing countries' progress in this field.

**Key words :** *Biodiversity mainstreaming, Biodiversity protection, Ecosystem services, Climate change policy, Agricultural policy, Policy analysis*

## Introduction

To ensure the food adequacy or to preserve the biodiversity that is key for the natural environment's functioning and, therefore, for any form of life? Now these problems and, rather the search for ways to solve them simultaneously, form the core of the global agenda (Delzeit *et al.*, 2017; Scherer *et al.*, 2020; Kok *et al.*, 2020). Competing for resources (in this context, spatial), production and

conservation activities need to find a way to coexist (Corlett, 2020). This requires a transformation of institutions, lifestyles, social, and production structures through the change of values and insights on human-nature interactions, and an implementation of integrated out-of-the-box solutions (SCBD, 2018; CBD, 2020). Biodiversity Mainstreaming (BM) advances this idea: implying biodiversity issues' integration and prioritization in the areas of human activities related to or influencing the biodiversity or

both (Huntley and Redford, 2014), it provides synergies between different policy areas and possible trade-offs (Karlsson-Vinkhuyzen *et al.*, 2017). Through BM knowledge and values on biodiversity and its protection become inclusive and overarching; this focuses decision-making on interactions of humans and biodiversity, human health, well-being and ecosystems' functioning (Sandifer *et al.*, 2015; Sumaila *et al.*, 2017; Albert *et al.*, 2020). In such a way, BM opens the door to a multidisciplinary approach and an integrated full-scale policy in the area of biodiversity protection. Such policy overcomes the limitations of the traditional conservation policy (rebound effects, insufficient funding, spatial constraints, etc.) (Andrés, 2012; Karlsson-Vinkhuyzen *et al.*, 2017; Jones *et al.*, 2020; Kok *et al.*, 2020; Martins *et al.*, 2020) through promotion of multifunctional land use and landscapes combining economic activities and conservation measures in a single space (Hediger and Lehmann, 2007; Norris, 2008; Holt *et al.*, 2016; Delzeit *et al.*, 2017; Kok *et al.*, 2020). In view of this, agriculture is a target sector for the BM (on a par with forestry, water management, tourism, etc.) (OECD, 2018; CBD, 2020). Moreover, dual role of agriculture concerning the biodiversity – it impacts on biodiversity and ecosystems' functioning (Andrés, 2012; Delzeit *et al.*, 2017; Kok *et al.*, 2020; Martins *et al.*, 2020) and, in turn, suffers from the natural imbalance, biodiversity loss, and ecosystems' disfunction (Norris, 2008; Andrés, 2012) – makes BM implementation in the sector necessary in the overall sustainability context. Integrating farming and conservation activities provides the broader context for biodiversity protection, desirable under the limited funding (Reyers *et al.*, 2012), with better outcomes in general (Harlio *et al.*, 2019). Integrating farming and conservation activities provides ecosystem services benefitting agriculture (Hediger and Lehmann, 2007; Delzeit *et al.*, 2017), so securing food adequacy and the overall sustainability (Holt *et al.*, 2016).

Now call for the BM is a part and parcel of a comprehensive global sustainability policy (UN, 2015; Technical, 2016; SCBD, 2018; CBD, 2020), and national efforts are to complete its whole puzzle. BM assessment at national level reveals insights on the way of the transmission of declared objectives of biodiversity issues integration into real actions and outcomes (Karlsson-Vinkhuyzen *et al.*, 2017; OECD, 2018; Whitehorn *et al.*, 2019). It focuses on national

and regional development strategies and plans, poverty alleviation strategies, sectoral policies, corporate and project documents with emphasis on biodiversity issues and values inclusion, policies' coherence, and implementation tools. Quantitative and qualitative assessments in a national context disclosure country-specific actions towards BM, allowing to identify and generalize sources of fallouts in this field (Karlsson-Vinkhuyzen *et al.*, 2017; OECD, 2018; Bouwma *et al.*, 2018; Zinngrebe, 2018; Whitehorn *et al.*, 2019).

Occupying 5.7% of European continent and being a home of more than third of Europe's biodiversity (On Basic, 2019), Ukraine represents an important party for global success on biodiversity loss prevention and overall sustainability movement. However, the limited funding, bureaucratization, inconsistency and declarativity of policy, lack of an economic assessment of biodiversity and ecosystem services, and weak links of policy measures with biodiversity targets (Vasyliuk, 2017; Sixth, 2018; Kubatko and Kubatko, 2019; Matus *et al.*, 2019; Danko *et al.*, 2020) impede the success of national conservation policy: Ukraine lags the plan of an expansion of protected areas (their share ranges from 5.32% (Central regions) to 11.13% (on the West) (Matus *et al.*, 2019). Against this backdrop, an intensive and monocultural agricultural land use, fuelled by focus on global commodity markets (Koblianska and Kalachevska, 2019) and complemented with an absence of any actions in the field of biodiversity protection by business entities, land users and decision-makers (Vasyliuk 2017; Grenz *et al.*, 2018), poses one of the main threats to biodiversity in Ukraine (Sixth, 2018). To solve these problems, in 2016–2018 an introduction of biodiversity values into national and regional development strategies was started. Now national strategic documents (On Basic, 2019; Strategy, 2020; State, 2020) call for the BM and the legal framework in this sphere is emerging. However, studies on the progress of integration of biodiversity issues across recent national and agriculture-specific policies are absent. Following the goal to fill this knowledge gap, this paper assesses the BM in Ukrainian national strategic policy and regulations of the agriculture to enlighten country's progress and fallouts. Our goal is to answer the question about real ability of emerging legislation to make the BM call viable; this embraces an investigation of addressing the biodiversity issues across the laws, on the used terminology, and on consistency

of goals, tools and outcomes prescribed by laws.

## Materials and Methods

For a start, we found desirable to analyse environmental effects of agriculture in Ukraine in brief, to give a clear picture of the problem. This, according to the OECD methodology (OECD, 2018), also reveals the BM success at a sectoral scale in a retrospect. The dataset for the analysis includes official data from state statistics on agricultural production and environmental indicators for 2010 and 2019, completed with available data on agricultural land use and quality.

General BM logic requires to outline strategic goals of biodiversity issues integration at national scale (within the national biodiversity strategy and action plan, national development strategy, poverty alleviation strategy, environmental strategy, budget plan, and land use plan) and to reflect these goals in specific plans and action programs for development of industries, regions, companies with proper targets, implementation tools, and outcomes (Karlsson-Vinkhuyzen *et al.*, 2017; OECD, 2018; Whitehorn *et al.*, 2019).

Outlining the BM goals at strategic level evolves connecting biodiversity issues and well-being in a clear and specific way through assessment of biodiversity role for poverty alleviation, well-being, industries and economy development. Analysing BM across countries, Whitehorn *et al.* (2019) proposed the framework to measure these issues quantitatively within the National Biodiversity Strategy and Action Plan (NBSAP). Following this logic, we applied Whitehorn *et al.* approach to assess the level of BM cohesion throughout nation-wide strategic regulations and agriculture-specific strategies in Ukraine. In contrast to the original approach, we complemented the assessment criteria with “climate change” notion, valuing it with 0.5 points.

Used terminology determines an accuracy and correctness of BM-targeted policy and its success (Bouwma *et al.*, 2018). Applying the content analysis, we studied the policy’s terminology coherence with the BM idea, searching for words “biodiversity” (and synonym “biological diversity”), “ecosystem”, “climate” throughout the legislative acts pertinent for the BM. We used an integrated search engine of national legal dataset (<https://zakon.rada.gov.ua/laws>) and of MS Word for drafts of regulations (absent in the national legal dataset), and then calcu-

lated the words’ frequency with MS Excel standard functions.

To trace the BM progress at different scales, we grouped regulations by the content and scope in the following way: national strategic documents (relevant for all sectors and BM-targeted), sectoral strategic documents, implementation regulations (action plans for all strategic documents and agriculture-specific, laws on strategic environmental assessment and environmental impact assessment), framework regulations in the field of environmental policy and agriculture (including land use regulations) (Table 1). Then, applying the content analysis (as described above), we calculated the average frequency of sought words per one legislative act within each group of regulations.

Further we conducted the qualitative study of legal acts, found to be the closest to the BM idea (according to the results of quantitative assessment of biodiversity issues inclusion and results of content analysis), to check the maturity of the BM through analysis of consistency of goals, objectives, tools, outcomes, and monitoring indicators set by laws. We also added a short overview of agriculture-specific regulations to conclude on potential of agricultural policy to release the BM.

## Results

### Environmental dimension of agriculture development in Ukraine

Agriculture is the main land user in Ukraine, and this makes it a key sector for biodiversity protection through the biodiversity mainstreaming (BM) implementation: being stable over the years, agricultural land area occupies 68.4% of total country’s area (Verner, 2020). At the same time, agricultural land structure demonstrates negative (from environmental point of view) changes for 2001-2019: extensive land areas, in particular, hayfields and pastures reduced by 365,3 thousand ha, while croplands increased by 280,8 thousand ha. So, as of the beginning of 2020, cropland amounted to 54,3% of the total country’s area (Verner, 2020).

Changes towards more intensive land use in agriculture come amid active use of agrochemicals, leading to the land degradation and depletion and other negative environmental effects. Supporting this thesis, Fig. 1 shows the absolute growth of areas with pesticides applied (up to 16092,4 thousand

hectares), wastes of pesticides and unsuitable agrochemicals, total air emissions and Carbone dioxide discharge from stationary sources for 2010-2019

with only volumes of water consumption and withdrawal reduction. As a result, humus content decreased from 3.19 to 3.16% (for 2010-2016) (Yatsuk,

**Table 1.** Grouping of legislative acts used for the content analysis of BM-targeted documents

Type of document	Title	Implementation regulations
National strategic documents	Law on Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period up to 2030 (BPSSEP, 2019)	Action Plan for the Implementation of the BPSSEP for 2020-2025 (APBPSSEP, Draft)
	Strategy for Sustainable Development of Ukraine (SDS, Draft)	not forced
	Strategy for Low-Carbon Development of Ukraine for the Period up to 2050 (SLCD, Draft)	not forced
	Strategy for the Poverty Alleviation (SPA, 2016)	Action Plan for 2020 on the SPA Implementation (APSPA, 2020)
	the Concept of Combating Land Degradation and Desertification (CCLDD, 2014)	Action Plan to Combat Land Degradation and Desertification (APCCLDD, 2016)
	The Concept of Implementation of State Policy in the Field of Climate Change for the Period up to 2030 (CISPCC, 2016)	an Action Plan for the Implementation of the CISPCC up to 2030 (APCISPCC, 2017)
	The State Strategy for Regional Development for 2021-2027 (SSRD, 2020)	not forced
Sectoral strategic documents (agriculture)	a Concept of Balanced Development of Agroecosystems in Ukraine until 2025 (CBDAE, 2003)	not forced
	Strategy for the Development of the Agricultural Sector of the Economy until 2020 (SDAS, 2013)	expired
	Strategy of Adaptation to Climate Change of Agriculture, Forestry and Fisheries of Ukraine until 2030 (SACCAFF, Draft)	not forced
	Strategy to Promote Private Investments in Agriculture until 2023 (SPPIA, 2019)	not forced
		Law on Strategic Environmental Assessment (2018)
		Methodical Recommendations for Strategic Environmental Assessment (2018)
		Law on Environmental Impact Assessment (2017)
Framework regulations on national environmental policy	Law on Environmental Protection (1991) Law on Ecological Network (2004) Law on Nature Reserve Fund of Ukraine (1992)	
Framework regulations in the field of agriculture	Law on Land Protection (2003) Land Code of Ukraine (2001) Law on Pesticides and Agrochemicals (1995) Law on Basic Principles and Requirements for Organic Production, Trade and Labeling of Organic Products (2018) Law on State Support for Agriculture in Ukraine (2004)	

2018); water and wind erosion affect already over 57.5% of country’s agricultural land (On Basic, 2019).

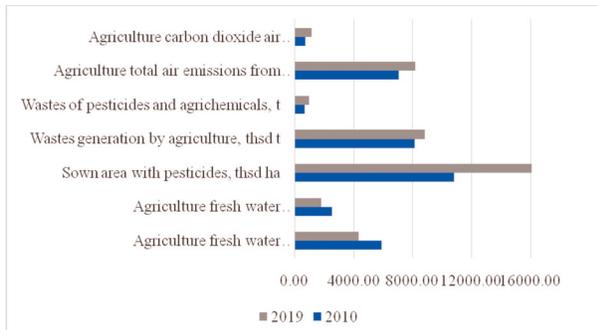


Fig. 1. Dynamics of environmental impact of agriculture in Ukraine for 2010-2019

Data source: <http://www.ukrstat.gov.ua>

Moreover, an assessment of agriculture output’s resource-intensiveness shows the same trends, except for wastes generated per unit of physical volume of gross output (Fig. 2). This indicates that each unit of agricultural goods produced becomes more environmentally harmful for Ukrainians in terms of air emissions, wastes of pesticides and impact on soils. There is no progress of sector’s environmental efficiency (concerning use and wastes of pesticides, air discharges): it is falling-of. This makes doubtless the biodiversity mainstreaming implementation in the sector.

**An assessment of the BM progress in Ukraine**

Actually, issues of biodiversity are not integrated into the Ukrainian policy (Table 2): the resulting

normalized scores are mostly due to the active involvement of various groups of stakeholders in policy’s development. The climate change, but not the biodiversity concerns, causes most values obtained for 2–5 criteria. Particularly, this is true for the BPSSEP, the SLCD, the SACCAFF about the second criterion; the SSRD and the SACCAFF about the third criterion; the SLCD about the fourth and fifth criteria. Concerning the given criteria, the land degradation (the second criterion, CCLDD) is also mentioned as threatening economy’s development; within the SPPIA biodiversity deterioration is seen as a constraint for investments (the third criterion). Such interpretations of biodiversity and ecosystem services (and absence of direct reference to the biodiversity) do not comply with the BM idea to the hilt. Therefore, the estimates are also partial, i.e., 0.5 instead of 1 score. Finally, the SSRD and the SLCD are found to be the closest to the BM idea (at least through the climate change notions), that makes the need to study them in detail.

The results of content analysis of terminology’s compliance with the BM (Fig. 3) testifies that the “climate” notion is the most widespread across the acts analysed in a mass, excluding for SDS and CBDAE, where the term “ecosystem” is more presented. Term “biodiversity” is most often used within the SDS, the CBDAE, the SACCAFF, the BPSSEP, and appropriate action plan (APBPSSEP).

Distribution of average values of these terms’ mentioning in legislative acts across identified groups of regulations (Table 1, Fig. 4) shows that declared goals at the strategic level are not ad-

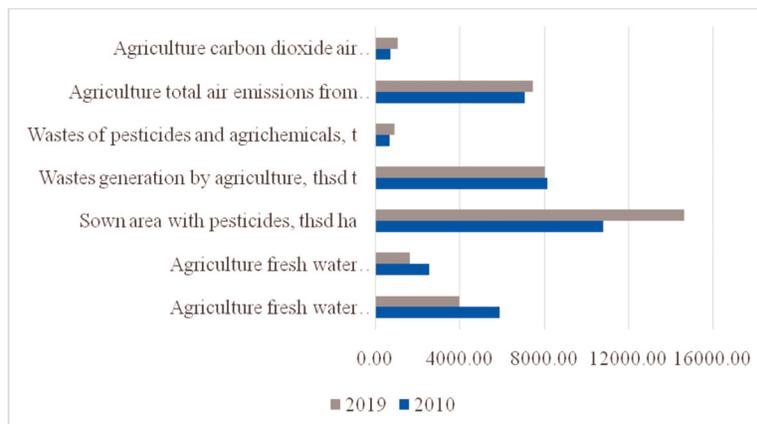


Fig. 2. Dynamics of environmental impact of agriculture in Ukraine for 2010-2019 per unit of gross output (accounting for index of physical volume of agriculture gross output)

Data source: <http://www.ukrstat.gov.ua>

**Table 1.** Assessment of the biodiversity issues inclusion within the frames of national and sectoral strategic documents\*

Assessment criterion	MAX value	BPSSEP	SDS draft	SLCD draft	SPA	CCLDD	SSRD	CBDAE	SDAS	CISPCC	SPPIA
1. Actors involved in the development	4	3	4	3	4	3	2	1	2	1	2
Public	1	1	1	1	1	1	1	1	1	1	1
Private	1	0	1	0	1	0	0	0	0	0	0
Civil society	1	1	1	1	1	1	1	0	1	0	1
Other (in this case – International organizations)	1	1	1	1	1	1	0	0	0	0	0
2. Reference for the potential contribution of biodiversity or ecosystem services, climatic system resilience to the economy	2	0,5	0	0,5	0	0,5	1	1	0	0,5	0
yes specific	1	0	0	0	0	0	0	0	0	0	0
yes vague	1	0,5	0	0,5	0	0,5	1	1	0	0,5	0
3. Accounting for threats for particular industries											
outcomes caused by biodiversity loss, ecosystem depletion or climate change	6	0	0	0	0	0	0,5	0	0	2	0,5
Agriculture	1	0	0	0	0	0	0,5	0	0	0,5	0,5
Forestry	1	0	0	0	0	0	0	0	0	0,5	0
Fishery	1	0	0	0	0	0	0	0	0	0,5	0
Water supply	1	0	0	0	0	0	0	0	0	0,5	0
4. Accounting for the role of sustainable management plans (and hence, biodiversity conservation) to improve the outcomes of particular industries	6	0	0	0,5	0	0	0,5	0	0	0	0
Forestry	1	0	0	0,5	0	0	0	0	0	0	0
Tourism	1	0	0	0	0	0	0,5	0	0	0	0
5. Accounting for threats of biodiversity conservation for particular industries	6	0	0	0,5	0	0	0	0	0	0	0
outcomes											
Forestry	1	0	0	0,5	0	0	0	0	0	0	0
Total	24	3,5	4	4,5	4	3,5	4	2,0	2	3,5	2,5
Normalized score	6	1,00	1,00	1,17	1,0	1,00	1,17	0,75	0,50	0,83	0,58

\* BPSSEP - Law of Ukraine On Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period up to 2030; SDS – Sustainable Development Strategy of Ukraine (draft); SLCD – Strategy of Low-Carbon Development of Ukraine for the Period up to 2050 (draft); SPA – Strategy for Poverty Alleviation; CCLDD – Concept of Combating Land Degradation and Desertification; SSRD – State Strategy for Regional Development for 2021-2027; CBDAE – Concept of Balanced Development of Agroecosystems in Ukraine until 2025; SDAS – Strategy for the Development of the Agricultural Sector of the Economy until 2020; CISPCC – Concept of Implementation of State Policy in the Field of Climate Change for the Period up to 2030; SPPIA – Strategy to Promote Private Investment in Agriculture until 2023.

Source: adapted on (Whitehorn *et al.*, 2019)

equately reflected within the implementation legislation and, ultimately, are lost at the framework, i.e., operational level. It is notable that the framework regulations on environmental policy do not contain references to the terms analysed, using general phrases like “ecology”, “environment” and so on in the wording. The framework regulations for agriculture, designed to provide and ensure the basic principles for land use, do not mention “biodiversity” and “ecosystem” at all, although soil is one of the specific forms of ecosystem, preservation of which is critical (Montanarella and Panagos, 2021). In a related vein, the issues of biodiversity and ecosystems are not relevant in formulating the content of state support for agriculture (On State, 2004), despite the fact that all sectoral strategic objectives indicate the need to stimulate and support environmentally friendly practices.

In general, the use of terms “rational nature use”, “ecologically harmonized management” is widespread across acts in the group of framework regulations (and others as well). These formulations are quite broad, vague, and do not provide clear rela-

tionships between activities, impacts on biodiversity (and other natural components), and outcomes.

**An overview of the BM-targeted legislation.**

To make a full conclusion on the policy congruence with the BM, it is advisable to qualitatively analyse the goals, measures, expected results, and their coherence. The national biodiversity strategy and action plan (the BPSSEP in Ukraine) and poverty alleviation strategy are seen as the basic regulations in the context of BM (Karlsson-Vinkhuyzen *et al.*, 2017; OECD, 2018; Whitehorn *et al.*, 2019). Additionally, we found the SSRD, the SLCD, the SDS, the CBDAE, and the SACCAFF to be the closest to the BM concept by addressing biodiversity issues and by used terminology. These documents are explored in detail behind.

Recognizing the low public awareness on the “environmental protection priorities” (also among economic agents), Law of Ukraine “On Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period up to 2030” (BPSSEP) (On Basic, 2019) calls for “an ecosystem approach in the

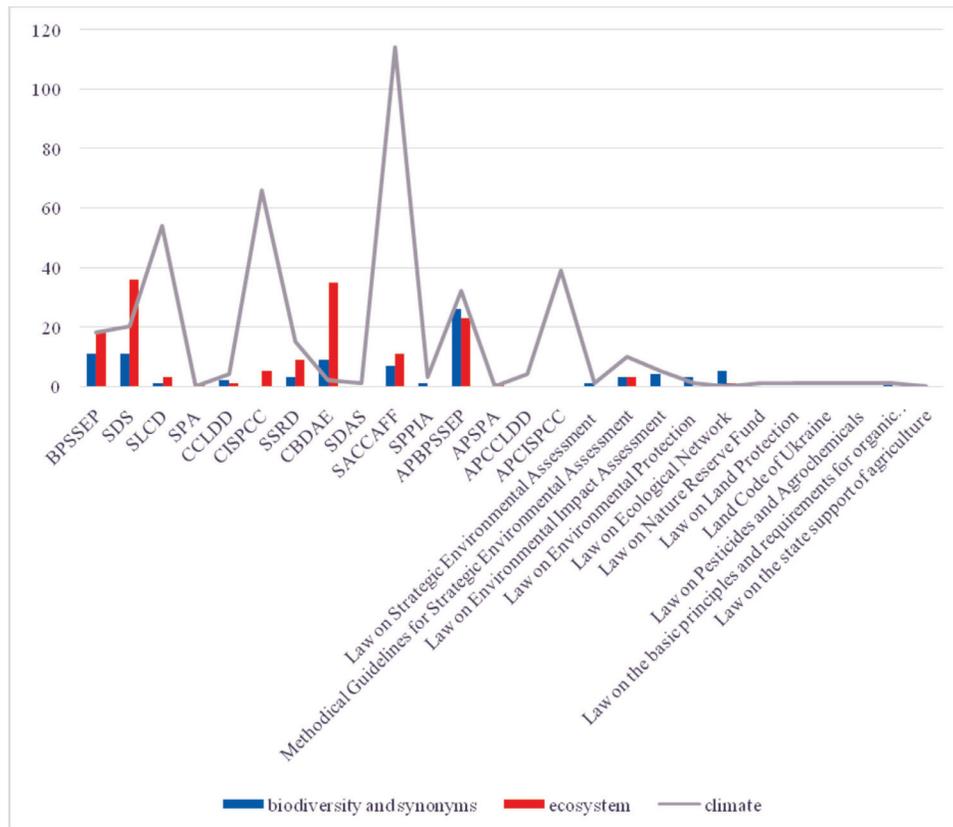
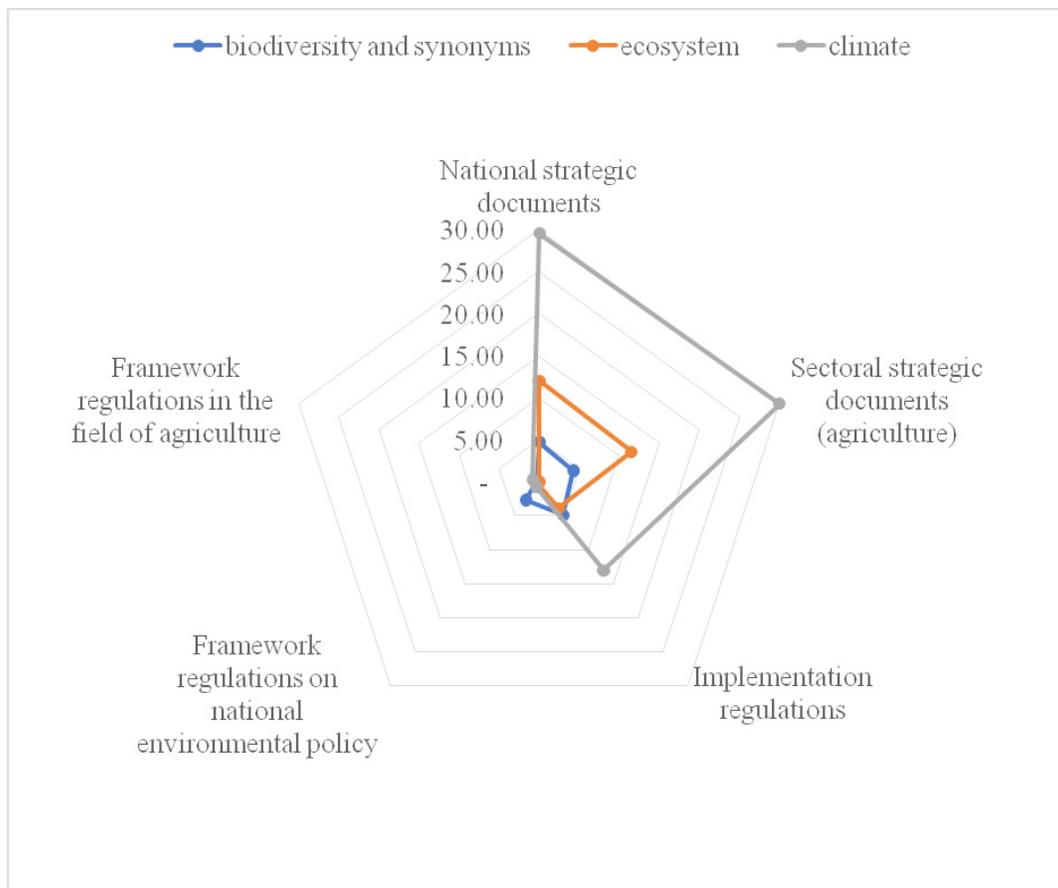


Fig. 3. Number of references to words “biodiversity” (and synonyms), “ecosystem”, “climate” in the text of legislative acts

sectoral policy and an improvement of the integrated environmental management”, for an accounting of “environmental issues” when developing the state planning documents and making decisions on economic activities; it points the BM – inclusion of “issues on biodiversity values in national, local, strategic, policy documents and plans for economic and sectors development” – among *the main* objectives. Strategy outlines a wide set of tools to implement this goal, in particular: information sharing and education activities, multisectoral partnership and international cooperation, environmental assessment and management, introduction of economic and financial tools. However, law sets only the number of conducted strategic environmental assessments to monitor the BM progress. This is true also for the draft of an action plan of BPSSEP implementation (National, 2020). Emphasizing an introduction of ecosystem approach, strategy targets energetic, defence, and manufacturing industries, ne-

glecting sectors directly responsible for biodiversity loss and ecosystems’ deterioration (agriculture, tourism, fishing, forestry, hunting, extractive industries). Pointing agriculture responsible for water pollution, land and soil imbalances (on a par with other industries), the law omits issues of biodiversity protection or ecosystem management implementation. Strategy overlooks clear linkages between human activities, biodiversity, ecosystems’ services and vice versa, and, aiming to preserve, assess, restore biodiversity providing ecosystems’ services by 2030, rests on extension of protected areas of natural reserves, to a greater extent (setting monitoring indicators of an increase of share of natural reserves areas up to 15%, ecological network areas up to 41%, extensive agricultural areas up to 15,8%, an achievement 85% score of environmental efficiency index).

*The Strategy for Poverty Alleviation (SPA)* (Strategy, 2016) disregards issues of biodiversity, ecosystems’



**Fig. 4.** Average number of references to words “biodiversity” (and synonyms), “ecosystem”, “climate” in the text of particular legislative act within a group\*  
\*according to the Table 1

services, climate change in the context of poverty and measures to overcome it. It postulates only the need to introduce economic incentives for land and soils protection, restoration and preservation of ecosystems (to ensure the equal access for social services), but without appropriate “expected results” and monitoring indicators mentioned. Following this task, an *Action Plan for 2020* (Action, 2020) calls for: a rational use of local recreational resources and areas of natural reserves to promote economic development and employment; an information sharing to raise the public awareness on nature reserve fund areas and objects’ value; an organization of temporary works to improve land and other natural resources quality and to promote employment. To monitor the action plan success, lawmakers set an increase of the number of people offering tourist and related services in rural areas resourced with areas and objects of the natural reserves. So, within the framework of SPA and its action plan, the BM is smoothing over, and biodiversity of the protected areas appears as an object of exploitation to alleviate rural poverty.

The State Strategy for Regional Development for 2021-2027 (SSRD) (State, 2020a) links the ecosystem services shortfall with both an environmental impact of industries in the regions and natural areas decline. The strategy recognizes the biodiversity loss as restraining regions’ development factor and the ecosystem services provided by protected areas as a business development driving force. Following the goals to preserve and restore ecosystems and to protect lands, strategy specifies the appropriate targets (an increase of restored ecosystems’ areas and of a humus content, an arable land reduction) without mentioning the tools. The strategy also calls for the BM, setting goals to integrate environmental issues in policymaking and to raise public awareness on the state, values and preservation of biodiversity and ecosystem services through environmental education. However, no monitoring indicators were mentioned in this context.

*Strategy for Sustainable Development of Ukraine (SDS, draft)* (Strategy, 2020b) promotes the expansion of green economy models and aims to stop the ecosystems’ degradation. The sixth strategic goal targets the biodiversity and ecosystem services and embraces the following performance targets by 2030: to conserve, restore and harmonize the use of terrestrial and aquatic ecosystems and appropriate services; to increase natural reserves’ areas share up

to 15%; to implement measures for degraded lands and soils restoration and to stop land degradation; to reduce cropland share by 10%. Moreover, the strategy outlines the targets to be completed by 2020 including the BM (to complete the process of an inclusion of biodiversity and ecosystems values in the process of national, regional and local planning, to improve the legislation in the field of biodiversity and ecosystem services’ management). This strategy (within the problem statement, goals and objectives sections) outlines and specifies BM the best compared with laws analysed above. However, its implementation tools are described rather superficially, using general phrases; relevant performance indicators include only the share of natural reserves’ areas, forests, and organic agricultural area. This, together with the expired timeframe for BM targets completion, acknowledges the declarativity of the strategy concerning the BM.

*Concept of Balanced Development of Agroecosystems (CBDAE)* (Concept, 2003) fits the BM idea the best. First, it regards agroecosystems as integral objects evolving natural and anthropogenic elements and their interrelations and promotes integrated management of natural resources within agricultural activities. Second, it calls for the formation of ecological network on agricultural lands, for the expansion of extensive agricultural areas, for the implementation of biodiversity monitoring indicators for agriculture, etc. Unfortunately, this concept was not forced by an appropriate action plan, and most of the important insights – on biodiversity mainstreaming and preservation in agriculture – were lost in further sector’s development strategic papers.

*Strategy of Low-Carbon Development of Ukraine for the Period up to 2050 (SLCD, draft)* (Strategy, 2017) in relation to agriculture calls for an improvement of operations with livestock by-products, fertilizers’ application, water management; it envisages an optimization of land use and land structure, an increase of forests and similar areas, an implementation of climate smart agriculture practices and economic incentives for rational land use, etc. The strategy does not target biodiversity and ecosystems within its frames. Moreover, this strategy is absent in the official dataset of regulations, so was not forced.

*Strategy for the Development of Agricultural Sector of Economy until 2020 (SDAS)* (Strategy, 2013) calls for the rational use of agricultural land and reduction of

sector's environmental impact, without addressing this in both the expected results section and the list of prior activities for state support. Measures to attract investments in environmentally friendly agricultural activities are also lost in the frame of Strategy to Promote Private Investment in Agriculture for the Period up to 2023 (SPPIA) (Strategy, 2019b). Introducing an ecosystem approach to adapt for the climate change, *Strategy of Adaptation to Climate Change of Agriculture, Forestry and Fisheries of Ukraine until 2030 (SACCAFF, draft)* (Strategy, 2019a) targets forestry and water management, but neglects agriculture. *The Concept of Combating Land Degradation and Desertification (CCLDD)* (Concept, 2014) expects to improve the status of harmed ecosystems, to preserve and restore biodiversity, and to increase the human well-being in a result (among others), but does not target these issues throughout the text. This concept repeats the provisions of CBD/AE in many concerns, but with less clarity and specificity of goals, tools, results and indicators in terms of the BM. Its action plan (National, 2016) is quite comprehensive, includes more than forty measures to be implemented until 2025, but does not contain terms "ecosystems" and "biodiversity".

## Discussion

The research shows the fall of the biodiversity mainstreaming (BM) in the Ukrainian context, in spite of the emerging call for BM and for an "implementation of the ecosystem approach in all spheres of socio-economic development" (On Basic, 2019).

First of all, BM policy fails at the stage of problem recognition. National strategies (for overall development policy, environmental, biodiversity protection, and agriculture-specific policy) fail to link biodiversity concerns with specific human activities, sectors' performance, human health, well-being, and vice versa in a clear and concrete way; biodiversity and ecosystem services are still seen rather background than targeted issues. Moreover, the controversial understanding of biodiversity and ecosystems issues spreads across the legislative acts revealing anthropocentric and consumer attitudes concerning the biodiversity; views on biodiversity as a target of traditional conservation policy only, instead of focusing on its sector-wide protection, are still dominant. The focus on defence and manufacturing industries in regard to the ecosystem ap-

proach implementation (BPSSEP) and the ignorance of agriculture in this context illustrates the irrelevant policy context for the BM.

Second, BM policy fails within the terminology used and its context. This problem roots from the absence of proper terminology throughout the legislation at different scales and policy domains. On the backbone of wide use of terms "biodiversity", "ecosystem" within emerging legislation (often controversially and with inappropriate context), the legal basics of environmental and land use policy are still governed by "ecology", "environment", "rational nature use", "ecologically harmonized management" terms impeding the raise of public awareness on biodiversity issues within professional communities. Additionally, instead of focusing on biodiversity issues, modern legislation emphasizes the "climate" notion. Despite the importance of this issue, such policy provides for only overcoming the effects of biodiversity loss, but not the root causes. Climate change is a result of irreversible loss of biodiversity and changes in ecosystems' functioning caused by anthropogenic activities (Fig. 5), but these linkages (grey arrows) are overlooked in the national discourse on climate change adaptation policy (Concept, 2016; Action, 2017; Strategy, 2019) recognizing only low-level effects, i.e., climate change impact (black arrow). BM should promote the better recognition of a whole complex of human-nature interrelations (with regard to biodiversity and ecosystems' functioning) and integrate this into the process of policy making. Without this we couldn't expect the success of even climate change adaptation policy.

In a third, BM fails at the level of implementation. Most strategies are not accompanied with the appropriate action plans; a lot of strategies are still remaining drafts, although it's been a while since their first issue. The declared BM-specific goals at national, regional and sectoral levels disappear at implementation and monitoring stages. There is a lack of coherence between objectives, measures, expected outcomes and monitoring indicators reflected in national and sectoral strategic legislation. Biodiversity problems continue to be recognized as a special policy case, related with natural reserves' areas and conservation measures. In particular, monitoring indicators proposed to trace the BM success (across different laws) include only a number of strategic environmental assessments (SEA) conducted, an increase of share of natural reserves' ar-

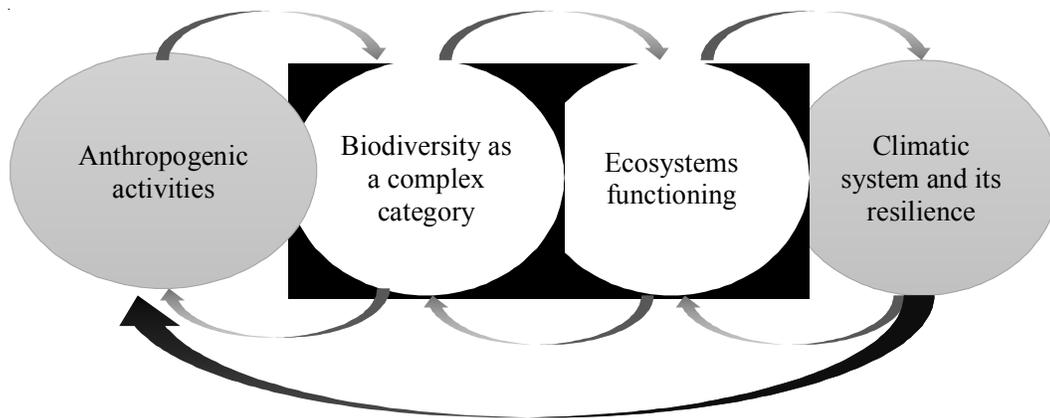


Fig. 5. Real and recognized interrelations of human activity and climate change

eas and extensive agricultural areas, an increase of restored ecosystems areas and a humus content, an arable land reduction.

Strategic environmental assessment is one of the tools for BM implementation (OECD, 2018; zuErmgassen *et al.*, 2019), but is not BM-targeted in a nutshell and needs additional specific procedures for biodiversity impact assessment (zu Ermgassen *et al.*, 2019). Our results support this: the Ukrainian guidelines to conduct SEA (Methodical, 2018), referencing the terms “biodiversity” and “ecosystem” only three times, is weakly linked with biodiversity issues.

**Agriculture-specific policy also fails the BM** Calling for environmentally friendly practices and land protection, sector’s strategies don’t outline the actions towards, as well as clear indicators to monitor the progress. Given the decrease of extensive areas for last years, the achievement of goal to increase them (and opposite – to decrease croplands) is under question. Given the environmental effects of agriculture, it’s clear that BM failure threatens biodiversity and further sector success.

Results of this research, however, go in line with previous studies indicating that biodiversity mainstreaming (BM) is challenging in most parts of the world: lack of coordination and realistic actions’ plans and discrepancy of policy with the BM idea diffuse around the countries (Bouwmaet *et al.*, 2018; Zinngrebe, 2018; Whitehorn *et al.*, 2019). The weak BM progress is peculiar to the countries with poor environmental policy (which is common for developing countries (Fatemiand Rezaei-Moghaddam, 2019), to the countries involved in global markets (Targettiet *et al.*, 2019; Martins *et al.*, 2020) with a

strong technological component of agricultural activity (Martins *et al.*, 2020), and Ukrainian case corroborates this.

## Conclusion

Failure of biodiversity mainstreaming (BM) at national scale breaks the global puzzle of joint efforts towards the biodiversity protection and overall sustainability. Unreal targets, unsuitable terminology and contexts, and expired time-frames – the main features of Ukrainian legislation calling for the BM – indicate policy’s fallout in Ukraine at national and sectoral (agriculture) level. It’s impossible to drive BM through only writing “ecosystem approach” as a strategic vision without addressing biodiversity issues (and even terminology) in a broader context of environmental and sectoral framework legislation. We suggest this is the main reason of BM failure in Ukrainian context. The whole review and improvement of legislation is needed to put the BM in place, starting with the basics of environmental policy, agriculture and land use regulations. The framework legislation in the field of environmental policy and land use needs to be reviewed as soon as possible to ensure their congruency with the modern views on human development and the role of biodiversity therein. Strengthening of national institutions through closer international cooperation and project activities in this area is of special significance in this regard. This could help exchange and disseminate knowledge on biodiversity issues and the BM, to apply the best world practices concerning the BM targeted regulations, economic assessment of biodiversity and eco-

systems values, promoting the biodiversity friendly and sustainable societies. Finally, laying bare on the problems relevant for other developing countries, the Ukrainian BM case highlights the need to rethink the future composition and tools of global biodiversity protection policy with emphasis on developing countries' progress in this field.

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