Improvement of the environment based on the assessment of knowledge and understanding of the ecosystem approach by civil servants in Kazakhstan.

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Annotation

The ecology of Kazakhstan requires improvement with the involvement of both the population and specialists from various organizations, including government officials. The purpose of this article was to assess knowledge, understanding of environmental problems in Kazakhstan by representatives of state authorities through a survey system.
For this purpose, we surveyed 256 employees of state institutions of Kazakhstan in 2019. The survey questions related to the current system of state management of natural resources and the current environmental situation in Kazakhstan. The processed data showed that only 24.6% of the respondents have an idea of ecosystem services. Almost none of the respondents viewed the ecosystem approach as an essential tool for overcoming poverty and inequality. 73% of respondents believe that environmental issues are present in sectoral plans and programs but require a qualitative addition. In comparison, 12% of representatives of land resources and 6% of environmentalists believe that the specifics of activities do not provide for environmental aspects in sectoral documents. Half of the interviewed environmentalists and representatives of land resources are completely satisfied with the existing procedure for environmental impact assessment (EIA), while 50% of

representatives for water resources management and subsoil use spoke about its absolute unsuitability.
Thus, the assessment of the readiness of public administration institutions in Kazakhstan showed the absence of interdepartmental communication and an integrated approach to improve the ecology of Kazakhstan. Environmental legislation is considered more of narrow departmental interests, without taking into account an integrated approach to biodiversity conservation. Closer cooperation with the work of the intergovernmental platform IPBES can serve the formation of a coordinated system of natural resource management in Kazakhstan.
Keywords: management, ecosystem approach, efficiency, motivation, survey.

Introduction

The implementation by the state of one of the main tasks of ensuring sustainable economic growth and improving the quality of life of the population depends on the surrounding ecosystems [TEEB, 2010]. That is why it is crucial to integrate ecosystem services into political decision-making processes related to the development and improvement of cities, the rational use of land, water, as well as flora and fauna. Among the complex of management problems, we examined the institutional diversity, both of the management methods themselves, and the heterogeneity of the subjects of natural resource management.

The growing popularity and actualization of the concept of ecosystem services [Schleyer et al., 2015; Braat and de Groot, 2012] can be traced in an increasing number of articles on this topic around the world. It is also since the emergence of the concept of ecosystem services has led to a shift in the paradigm of nature conservation from its intrinsic values towards a more anthropocentric side. The balance of the interests of nature in combination with the values of people, and their importance as a life support system on which people depend, are part of this paradigm [Loft et al., 2015; Folke 2007; Costanza et al., 1997]. This transformation was accompanied by a change in our understanding of governance as a way of

coordinating society [Kemp et al., 2005], in matters of environmental conservation. In studies of a similar nature, the methodology includes qualitative benchmarking, analysis of stated preferences, conditional valuation, economic experimentation, participatory social media analysis, simulation and role-playing games, and modelling of ecosystem services. [Sattlera, 2018]. The assessment of the priorities of local and regional managers by re-analyzing data from a nationwide stakeholder survey on environmental remediation, carried out by Hagger et al. [Hagger et al., 2017], was taken into account when forming the list of questions in the questionnaire.

Also, semi-structured interviews with managers for assessing climate risks are used in climatic conditions similar to Kazakhstan in Australia [Matzeka, 2019]. Also, researchers note the lack of interaction and cooperation of numerous participants involved in the management of ecosystem services as the main problem of the inefficiency of the management system [Lienhoopa, 2018]. Some authors consider the management system for ecosystem services as the formation and institutionalization of mechanisms for mutual decision-making by involved entities [Rival and Muradian, 2013]. According to Primmer and Furman [Primmer and Furman, 2012], ecosystem service management brings together knowledge from different disciplines and stakeholders who understand and manage ecosystem services and benefit from them.

In turn, the main problem in managing ecosystem services is the multiplicity of actors involved [Loft et al., 2015]. As shown by various approaches to assessing the value of nature, nature is a multifaceted source of human well-being, and the degradation of ecosystems leads to huge costs of the national economy [Pascual et al., 2017; Costanza et al., 2014]. However, the stakeholders in the management of ecosystem services are not only numerous but also diverse and treat the structure of ecosystem services in very different ways [Ruckelshaus et al., 2015]. Their interests in ecosystem management differ depending on whether they consume or provide ecosystem services [Rode et al., 2016]. Since beneficiaries and suppliers tend to be dispersed vertically at several levels of government and horizontally across sectors,

there is often a lack of coordination between them [Plieninger et al. 2012; Wüstemann et al., 2017]. Also, they hold multiple values, with individual value judgments often lacking transparency and a shared understanding of what is perceived as a service and what are the appropriate authorities that value the importance of the service. [Vatn, 2005; Martín-López et al., 2014; Díaz et al., 2015; Maier and Feest, 2016]. The perceived benefits of the ecosystem expressed in the words of the people themselves, contribute to a more accurate assessment of ecosystem services, the development of consumption policies, improved user experience and the encouragement of pro-ecological behaviour. [Asah, 2014]. It is assumed that the success of efforts to change attitudes towards nature depends on the extent to which such efforts are aimed at fulfilling the functions of these attitudes and behaviour (Smith et al., 1956, Katz, 1960). That is, if managers want to effectively compose and regulate specific behaviour, effectively manage ecosystem services, they must first understand what and how people gain or lose (direct and indirect benefits from ecosystems) by participating in such behaviour.

Thus, understanding how people perceive the benefits of ecosystems is essential for effective ecosystem management and for formulating effective policies that promote sustainable livelihoods and human well-being.

The purpose of the study is to develop recommendations for the comprehensive improvement of the environment in Kazakhstan based on the assessment of the knowledge, understanding of the ecosystem approach by government officials in the Republic of Kazakhstan.

Materials and methods

State institutions and tools for natural resource management

The subject of this research is the system of state management of natural resources in the Republic of Kazakhstan. In this regard, it is supposed to consider in detail the institutions of state management of natural resources available in the country and the instruments through which the state policy in this area is implemented. The

existing institutions of state management of natural resources have undergone numerous changes throughout the independence of Kazakhstan.

Separately, I would like to note the steps taken to improve the efficiency of the public administration system for the delineation of powers between the levels of public administration in 2014. Functions were transferred from the government to central state bodies and departments (hereinafter referred to as the CGB), from the CGB to local executive bodies (hereinafter referred to as the LEB) and from the LEB of regional significance to the local executive bodies of districts. The system of state power for the formation and implementation of environmental policy, coordination of management processes in the areas of environmental protection, protection, control and supervision of the rational use of natural resources, use and protection of water resources, land resources, water supply, wastewater disposal, forestry, protection, reproduction and use fauna, and specially protected natural areas are shown in Figure 1.

At the local level, state policy in the field of environmental protection and rational use of natural resources is carried out by local representative and executive state bodies, as well as local self-government bodies.

Thus, the sociological study covered persons holding leading positions in government agencies, subordinate enterprises and institutions responsible for the conservation and rational use of natural resources.

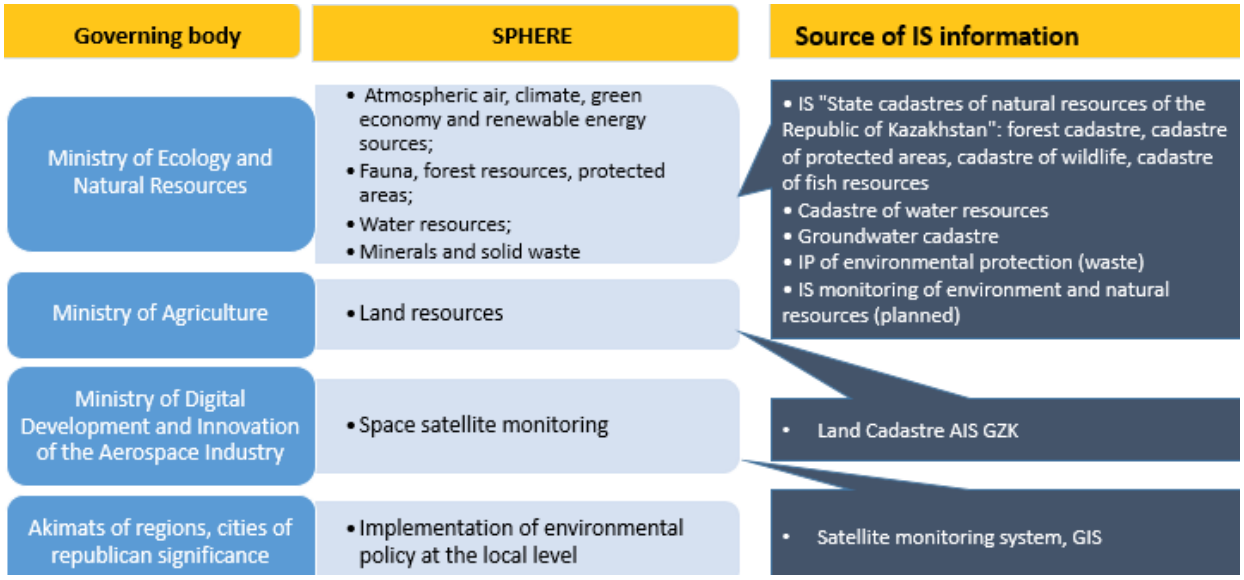

Figure: 1. Institutes of state environment management in Kazakhstan.

Information Systems

IS "State Cadastres of Natural Resources" (IS "SCNR RK") is a systematic collection of information on the quantitative and qualitative indicators of natural resources. The main goal of the IS "SCNR RK" is a comprehensive nationwide accounting of natural resources of the Republic of Kazakhstan and the standardization of methods of accumulation, storage and processing of natural resource information based on the use of modern software and hardware. Consists of 4 subsystems: forest cadastre, cadastre of specially protected natural areas, cadastre of wildlife and cadastre of fish resources. The source of data for the indicated cadastres is the regional territorial inspectorates of the Committee for Forestry and Wildlife. The frequency of entering data into the system is once a year. This year, it was planned to integrate the IS "SCNR RK" with the land cadastre system of the Ministry of Agriculture of the Republic of Kazakhstan. In 2021, it is planned to integrate with the systems of the state cadastre of deposits and the cadastre of water resources in order to ensure a single nationwide comprehensive accounting and assessment of the natural and economic potential of the Republic of Kazakhstan. In the future, it is planned to introduce it into the Unified State System for Monitoring the Environment and Natural Resources as part of the section for monitoring natural resources.

Legislation

Main documents of environmental legislation are: Environmental, Land, Water, Forest, Tax and Administrative codes. Laws: "On protection, reproduction and use of the animal world"; "On Specially Protected Natural Areas", "On Compulsory Environmental Insurance", "On the Support of Renewable Energy Sources", more than 40 legislative acts of the Republic of Kazakhstan and about 2000 regulatory legal acts are shown in Figure 2. Also, the Republic of Kazakhstan has ratified over 30 environmental conventions and protocols to them.

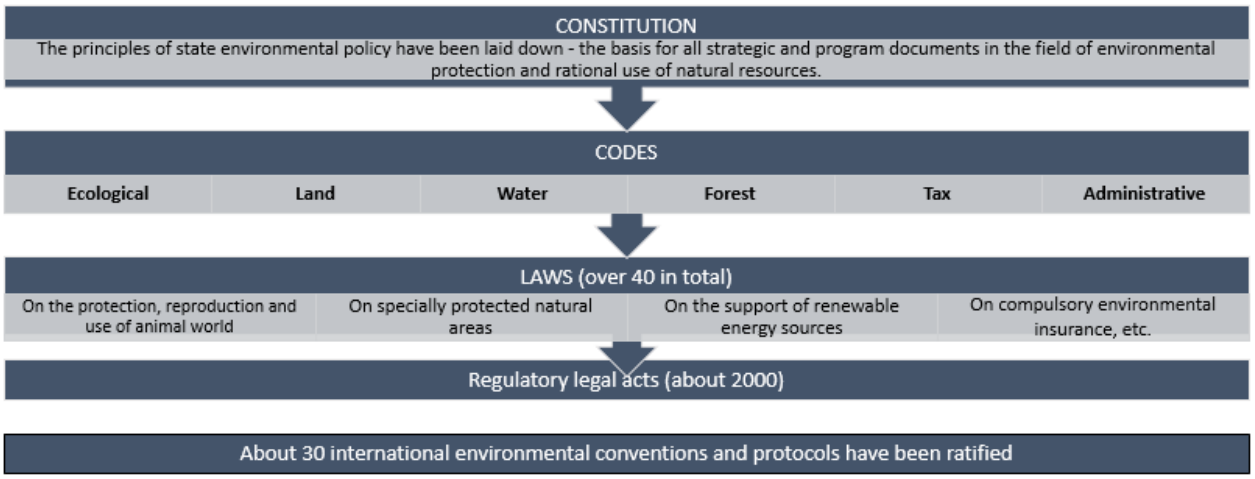

Figure: 2. Environmental legislation in Kazakhstan.

Over the years, Kazakhstan has ratified the Convention and Biodiversity (1994), the Convention to Combat Desertification and Drought (1997), the Framework Convention on Climate Change (2009), as well as several relevant protocols, namely, the Cartagena Protocol on Biosafety (2008) and the Kyoto Protocol (2009), in which it pledged to implement directives calling on the international community to contribute to countering the impacts of climate change, land degradation and the loss of globally significant biodiversity. In the Strategy "Kazakhstan-2050": a new political course of an established state "one of the ten global challenges facing humanity in the 21st century, the threat of depletion of natural resources is indicated. The Concept for Kazakhstan's entry into the 30 most developed countries of the world stipulates that every citizen of the country must be provided with access to clean water, air and full-fledged biological resources [Ukaz ..., 2014].

The Programm for the development of a green economy laid the foundations for deep systemic transformations with the aim of transitioning to an economy of a new formation by increasing the welfare, quality of life of the population and the country's entry into the top 30 most developed countries of the world while minimizing the burden on the environment and degradation of natural resources [Resolution ..., 2013]. It is assumed that, as a result of a change in the existing trajectory of development of the economy of Kazakhstan, by 2030 the country will be able to restore water and land resources and in many respects will be equal in terms of average indicators of the efficiency of the use of natural capital with the

member countries of the Organization for Economic Cooperation and Development (OECD) and other developed countries.

The measurement of the level of involvement of decision-makers in the application and use of the ecosystem approach was carried out based on qualitative data analysis. The data were collected through a structured interview using a pre-prepared questionnaire containing 14 questions. Objects of research - persons holding leadership positions are the main drivers of the development of the ecosystem approach, being a key link in the practical application of scientific knowledge in the field of ecosystem services. [TEEB, 2010]. The main criterion for the selection of respondents was their occupation of a leading position in a state organization of the central or regional level of government responsible for the conservation and rational use of natural resources (fauna and flora, specially protected natural areas (SPNA), water and land resources, ecology).

In total, 256 persons holding leading positions in various government bodies took part in the survey. The characteristics of the respondents' activities are classified into six main areas: geology and subsoil use; protection and use of land and water resources; conservation and use of biological resources and protected areas; in the implementation of environmental policy. Information about respondents was also classified by levels of governance, both vertically and horizontally. Thus, the respondent in the course of the survey identified himself as a representative of the central or local executive body, as well as a representative of the upper or lower management level

Figure: 3. Share of respondents by the level of governance.

Figure 3 shows a picture of the description of respondents who are represented by representatives of territorial subdivisions and subordinate organizations of central government bodies (TS CGB) - 188 respondents (73.4%), 36 respondents (14%) are representatives of central government bodies and their departments (CGB), 17 respondents (6.6%) represent territorial subdivisions and subordinate organizations of local executive bodies in the field of natural resources and land relations (TS LEB), and 15 respondents (5.9%) are representatives of Akim's offices of a region, city, district or village (LEB).

A qualitative study was carried out to study the individual aspect of social practice - the real-life experience of leaders at different levels, through the prism of which a more comprehensive layer of problems related to public administration as a whole was considered. [Semenova, 1998]

This analysis made it possible to correlate the managerial roles of leaders responsible for developing industry development policies with those responsible for organizing their implementation in the field.

The primary tool for conducting qualitative research is Microsoft POWER BI software, which allows a complex multi-level cross-analysis of the content of respondents' answers. It also made it possible to compare the level of awareness and motivation between different levels of government, both vertically and horizontally. The advantage of focus group interviews used in our survey is supported by the research of Asah [Asah et al, 2014] as to how respondents perceive and construct the benefits they receive from ecosystems. First, focus group interviews can create a comfortable and supportive environment that fosters self-disclosure among respondents, which itself lead to a deeper understanding of ecosystem services [Krueger and Casey, 2000]. Second, quantitative approaches to social polling are subject to primary affects — the information provided to respondents influences their responses [Schuman and Presser, 1981].

The level of awareness of the practical application of the ecosystem approach by decision-makers in the relevant industry was correlated with the actual state and ability of nature to provide ecosystem services.

It is also essential to study the attitude to the implementation of the ecosystem approach, taking into account the gender of the respondents involved in the management of ecosystem services.

To effectively manage ecosystem services, managers must themselves understand the direct and indirect benefits of ecosystems [Asah et al., 2014]. Thus, a good understanding of how people perceive the benefits of ecosystems is essential for effective ecosystem management and for developing effective policies that contribute to sustainable livelihoods and increased well-being. [Smith et al., 1956; Katz, 1960].

Additional sources of information were also quantitative statistical data on the dynamics of the state of individual ecosystems, considered on the analytical approach [IPBES. 2018].

Limitations of the study are related to the use of personal data of persons covered by the sociological study, i.e. only a generalized analysis of the sociological survey was presented.

Results

Institutional Assessment

For this block of questions, the respondents were assessed on the quality of the sectoral regulatory framework, program and strategic documents for the presence of the basic principles of the ecosystem approach.

In the overall picture, 73% of respondents believe that environmental issues are presented in sectoral plans and programs, but they require a qualitative addition.

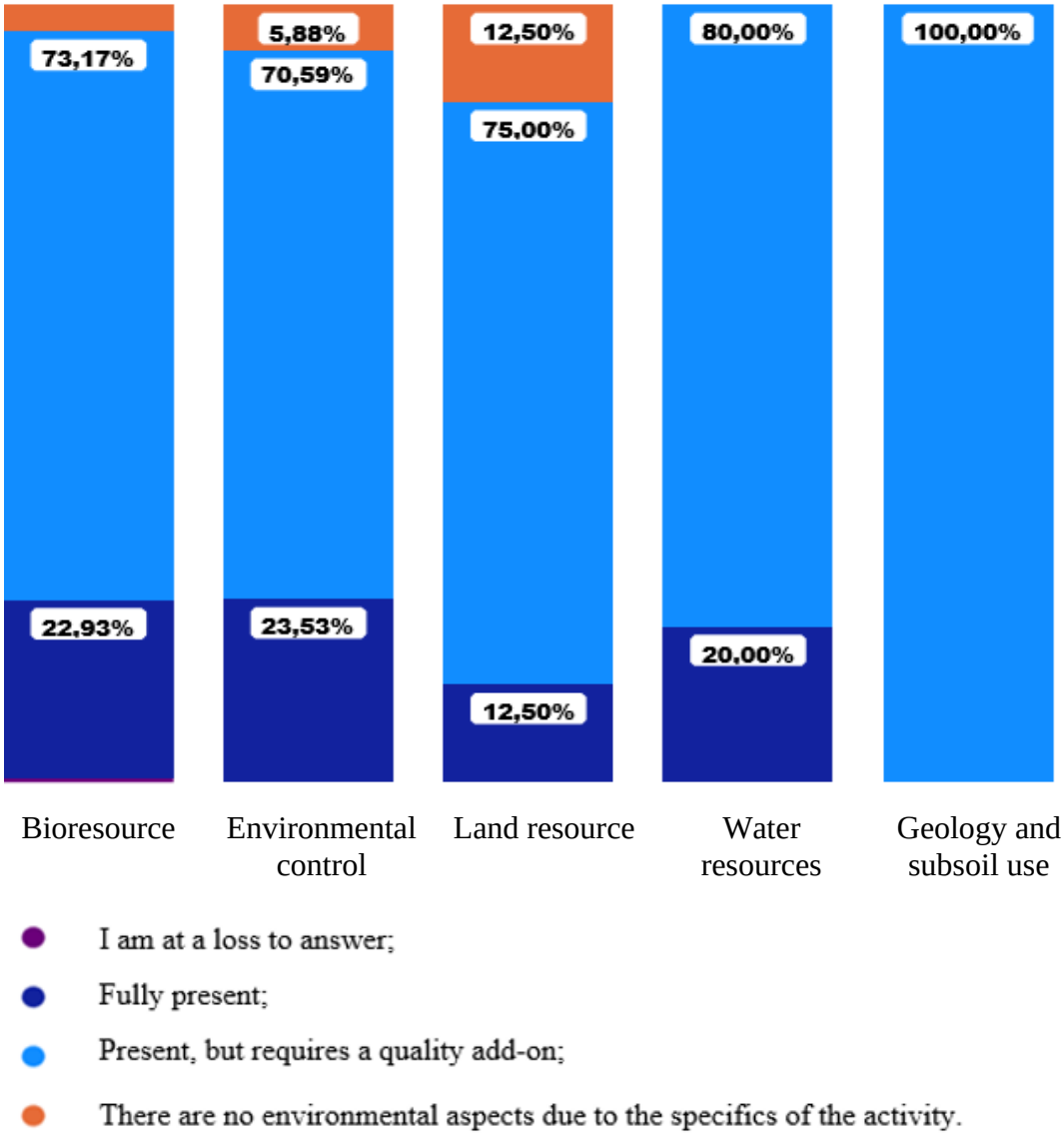

Figure 4. Evaluation of sectoral program and strategic documents for the presence of environmental conservation aspects.

At the same time, 22.3% believe that they are fully reflected, and almost 4%, every fifth of which are representatives in the field of land resources, said that the specifics of activities do not stipulate the presence of environmental aspects in sectoral documents.

Further, the question concerned the existing procedure for conducting an Environmental Impact Assessment (EIA) in matters of ecosystem conservation.

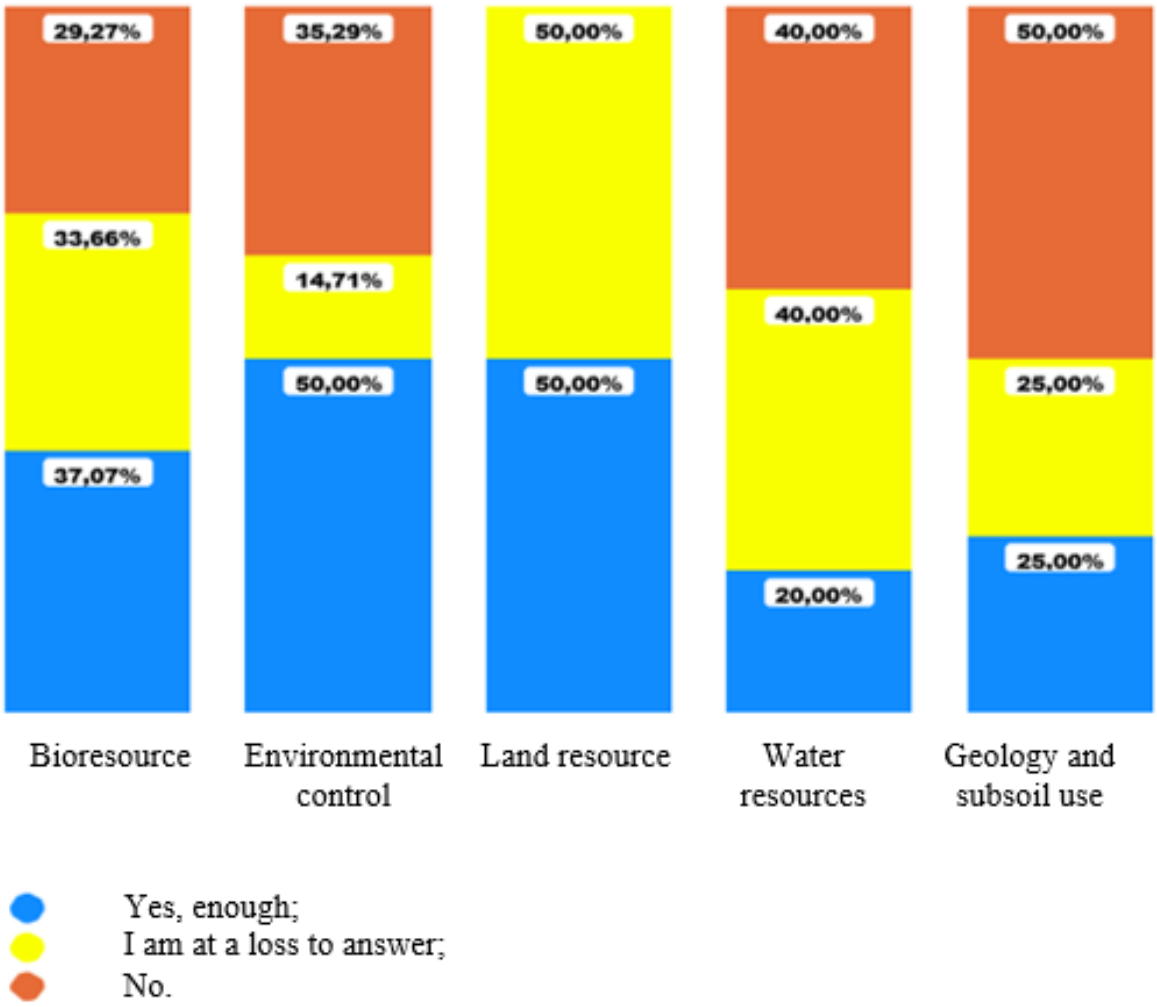

Figure: 5. Assessment of the existing EIA mechanism.

In the general picture, the number of those who answered affirmatively to this question was 38.7%, while 29.7% answered that the existing mechanisms for the conservation of ecosystems are not enough. The remaining 31.6% found it difficult to answer this question.

We noted that every second (50%) representative of the state body responsible for conducting the EIA at the central and local levels is completely satisfied with the EIA mechanism, while 14.7% of them found it difficult to answer this question.

The most significant concern about the lack of development of the EIA mechanism for the preservation of ecosystems was expressed by representatives of state bodies in the field of conservation and use of water resources and geology and subsoil use, 40% and 50%, respectively.

Assessment of the level of perception and motivation

The criteria for this assessment was the analysis of the survey results in terms of the level of respondents' perception of the ecosystem approach principles through the prism of values, inner beliefs and life experience.

The first question concerned the determination of the respondent's level of perception regarding responsibility for the state of the environment in the country.

In the overall picture, 40.2% of the respondents believe that the ecological state of the environment depends on the country's citizens, every third (30.9%) believes that the state of the environment depends on the authorities, one in four says that the owners and management of enterprises play the central role in the improvement/deterioration of the environment and 3.5% of respondents found it difficult to answer.

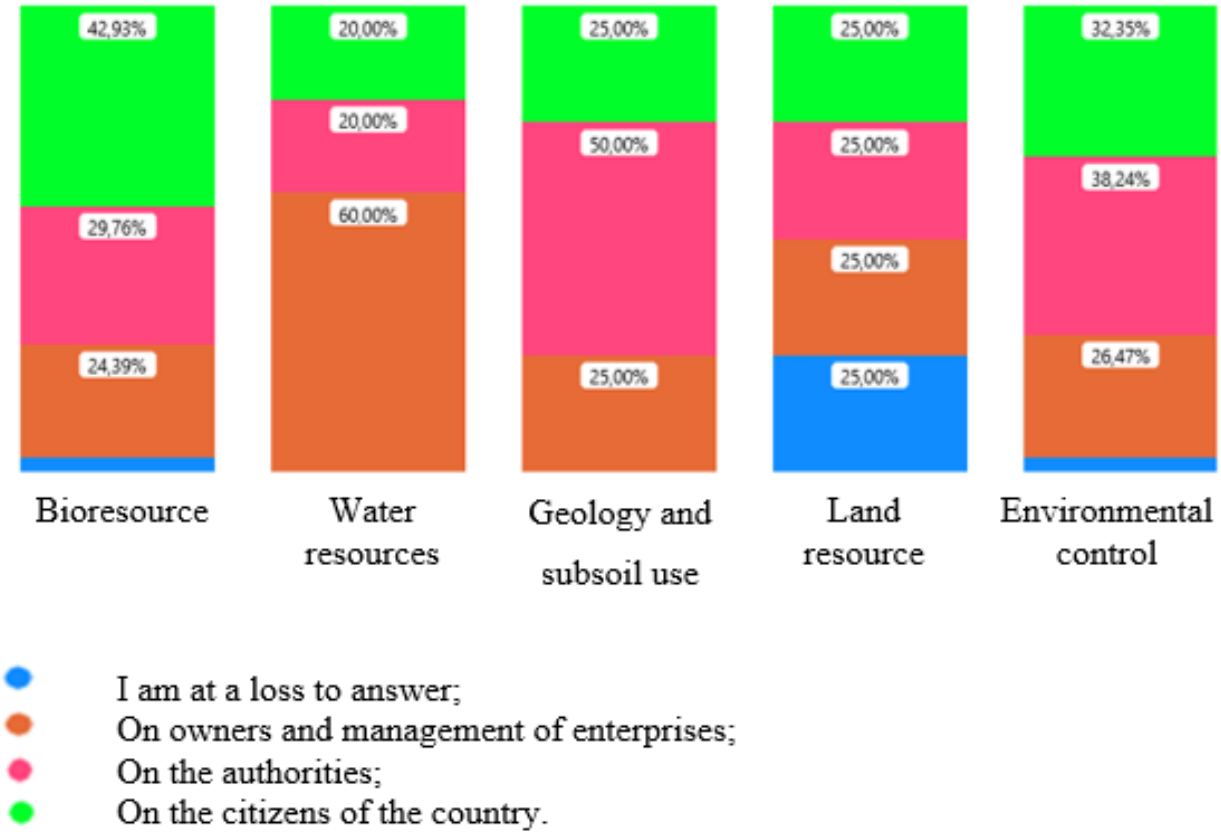

Figure: 6. Cross-section of responses by factors ecological state of the environment

Meanwhile, a cross-analysis of the data obtained showed that representatives of the local executive bodies assign responsibility for the state of the environment equally to the owners of enterprises and the authorities (40% each), and only one in five of them believes that the attitude of the citizens is important.

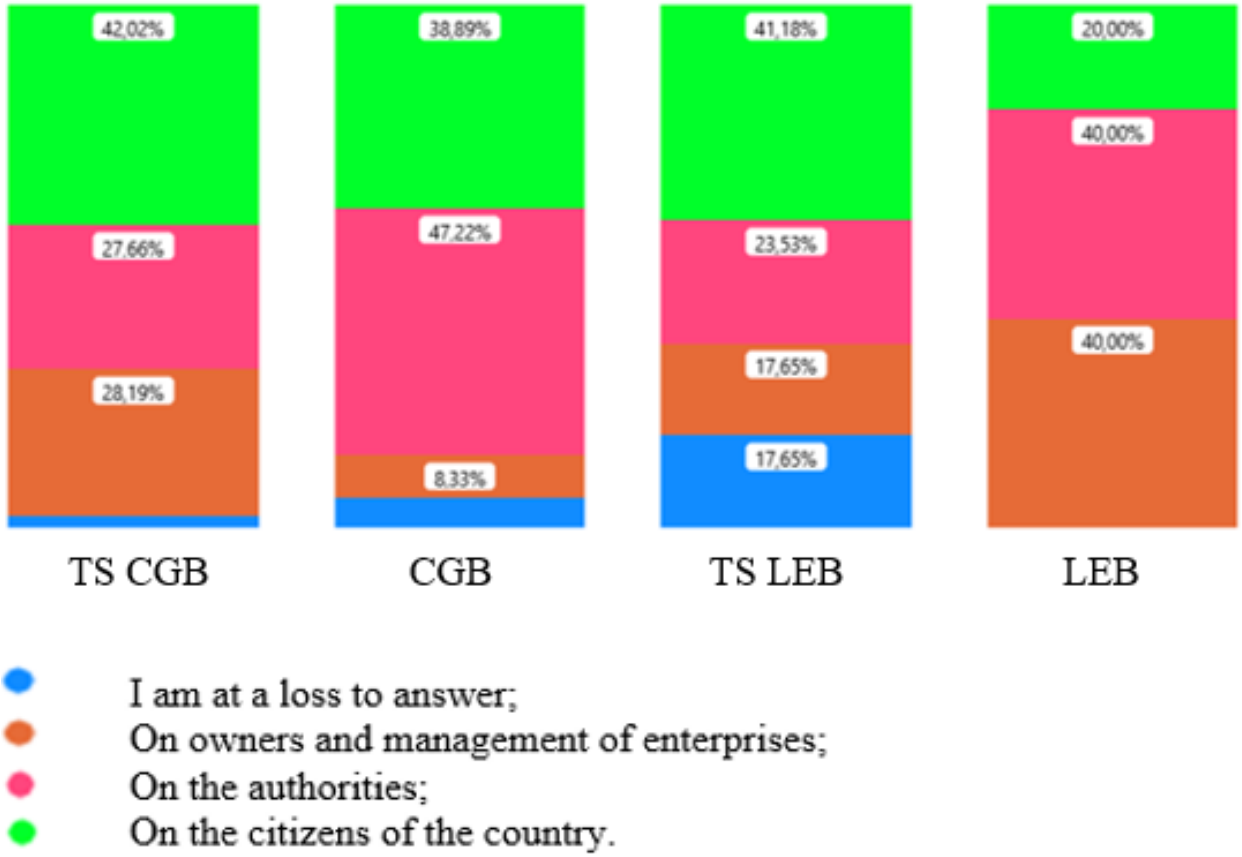

Figure: *7.* Cross-section of responses by factors ecological state of the environment by central and local executive bodies

Representatives of the CGB believe that the environmental situation to a greater extent, 47.2% depends on the authorities, and 38.9% believe that it depends on the citizens. At the same time, environmentalists note 61.5% of cases, while every third blame the country's residents (30.8%) and 7.7% believe that the prominent role in the state of the environment belongs to the owners of enterprises.

In contrast to ecologists, representatives of water and land resources, on the contrary, believe that responsibility for the state of the environment lies mainly on the owners and management of enterprises (60%, 66.7%).

To determine the level of awareness and motivation of decision-makers, we proposed to prioritize the value of a healthy ecosystem for the state and a person according to 4 indicators (social, economic, scientific and environmental)

Among the total number of respondents, the picture is as follows:

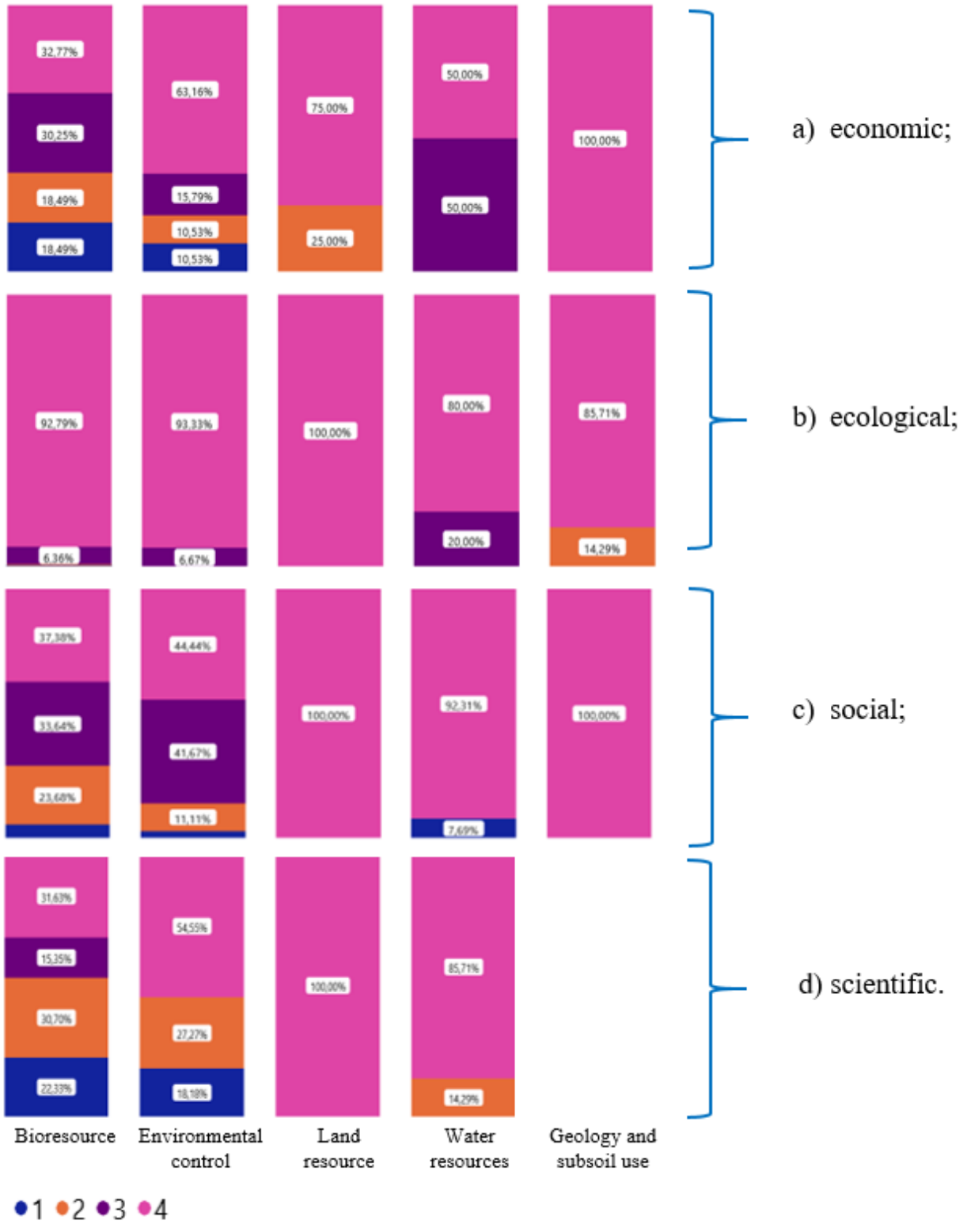

Figure: 8. The value of a healthy ecosystem for the state and people

Besides, some respondents gave such additional categories of the value of a healthy ecosystem as biological, political, technological, cultural, educational and public.

Assessment of the level of communication

This cross-section of questions in Figure 9 helps determine the level of accessibility of information to decision-makers. This criterion is one of the main in the process of implementing the ecosystem approach. Here one can observe a mixed opinion both for the industry representatives as well as among the levels of government.

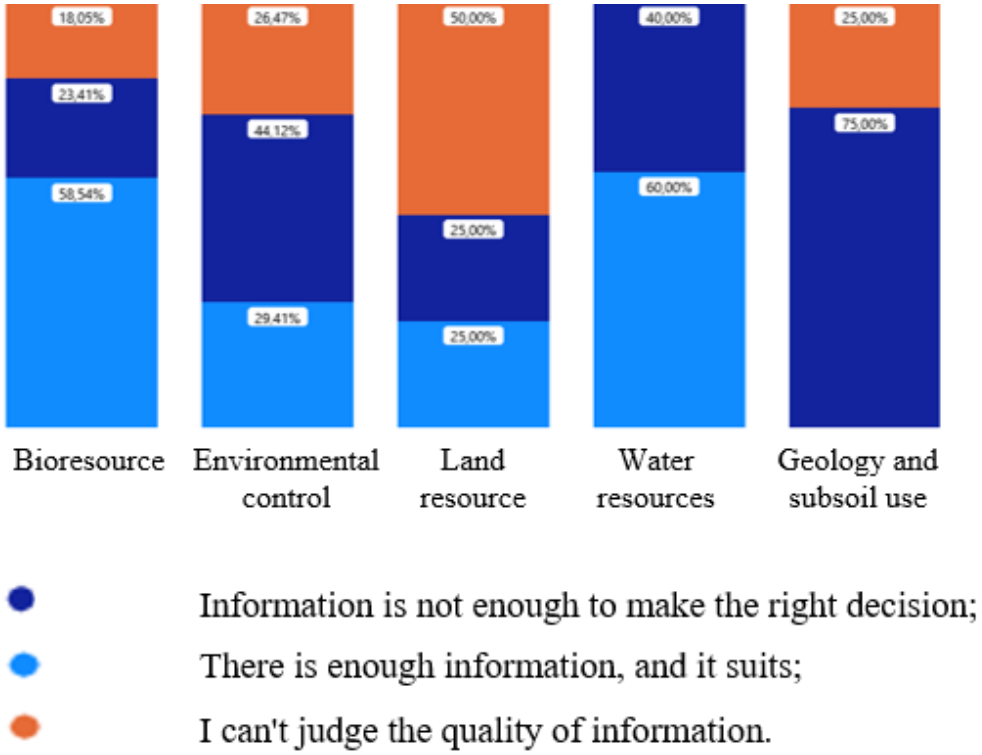

Figure: 9. Level of availability of qualitative information for decision making.

Assessment of the level of basic knowledge

Assessment of the level of basic knowledge of managers on the ecosystem approach is based on data processing on four questions shown in Figure 10.

While measuring the level of understanding the term “ecosystem services”, in the general picture, only every fourth (24.6%) has an idea of ecosystem services and more than half of the total number of respondents confuse this concept with the term “public service” (58%).

Also, 16.8% of the respondents believe that the term "ecosystem service" is associated exclusively with the activities of state bodies responsible for the implementation of environmental policy.

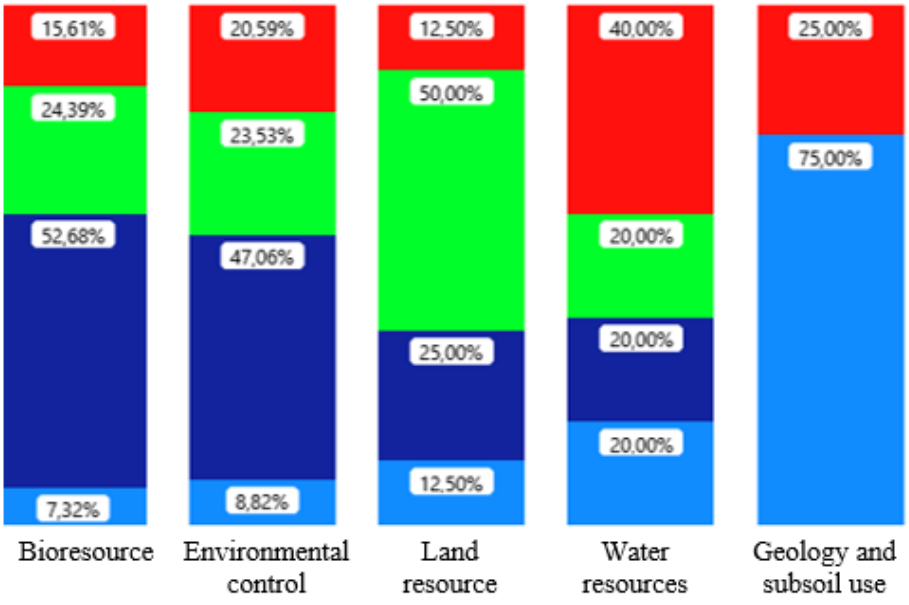

Figure: 10. Results of the survey on the term "ecosystem service" by industry cut (correct answer in green)

The survey showed that respondents have little understanding of the relationship between ecosystem services and the ecosystem approach. Only 34% of those who correctly disclosed the concept of "ecosystem services" correctly defined the "ecosystem approach".

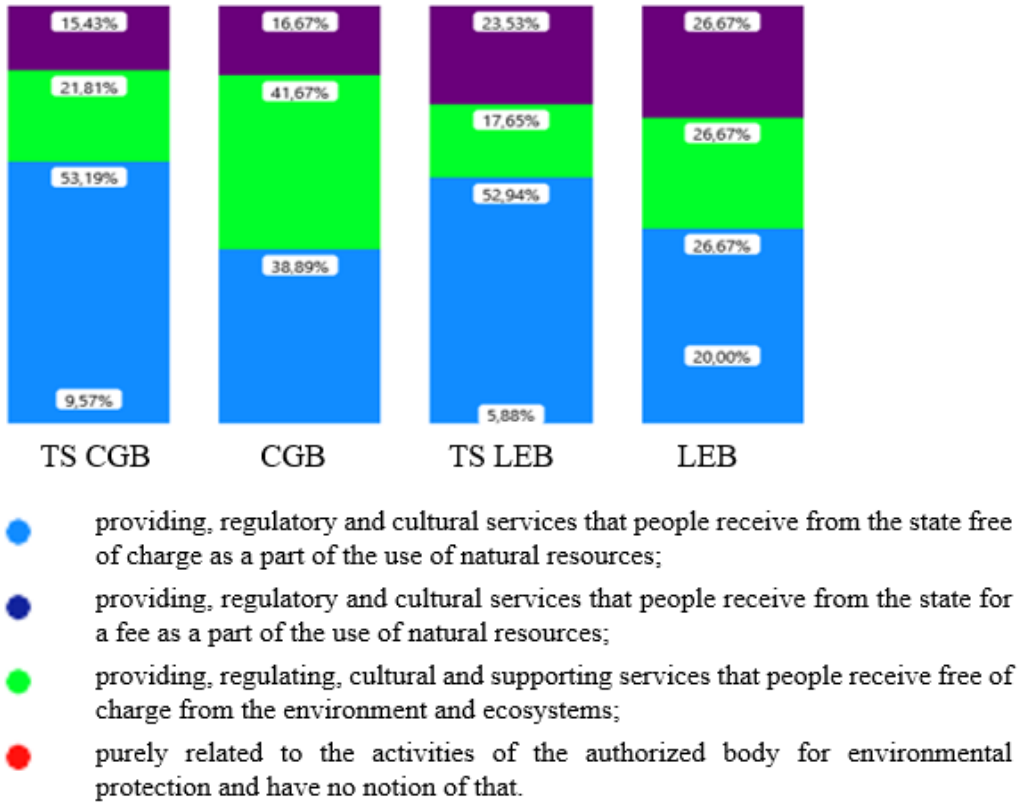

Figure: 11. Results of the survey on the term "ecosystem service" by the level of management

The next one concerned the definition of the “Ecosystem Approach”. (We asked to choose one of the most complete of four answer options)

It should be noted that a critical socio-economic aspect, considering the ecosystem approach as an essential tool for enhancing sustainable development and fighting poverty, was indicated by only about 1% of all respondents.

The next block of questions is devoted to the role of accounting and investment of natural capital in favour of the country's economic development.

The survey on categories of natural capital assets showed significant awareness (85.6%) of the respondents.

The majority of those surveyed (64.4% + 27%) generally agree with the statement that the transition to a green economy relies on natural capital with investment in it for economic development.

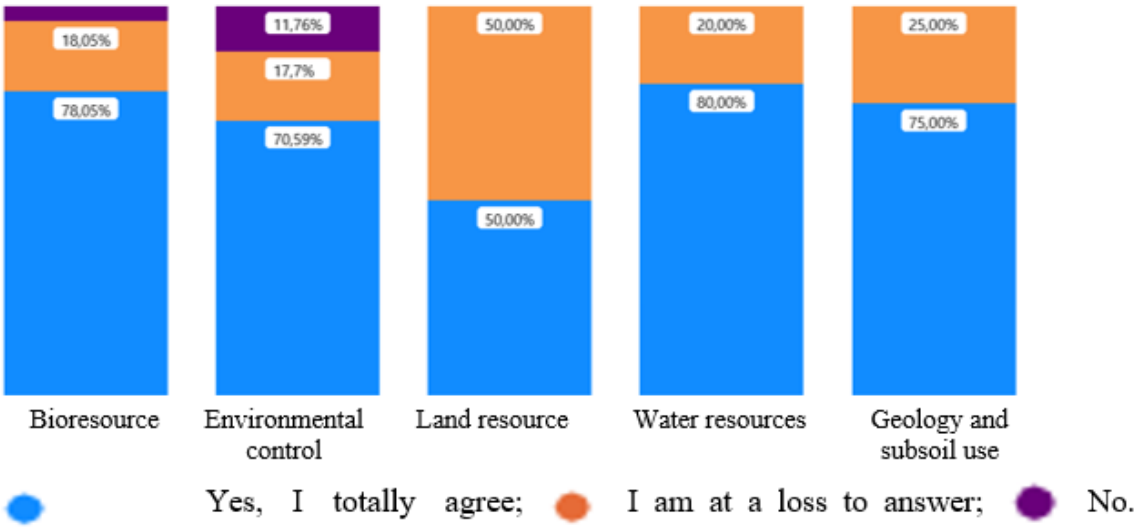

Figure: 12. The level of understanding of the role of natural capital in the development of a green economy.

The results of the responses of the CGB respondents in the field of environmental policy look ambiguous, 14% of whom do not agree with the effectiveness of investment mesures in natural capital.

Discussion

In modern literature [Díaz et al., 2019], the causes of environmental depletion and the loss of biodiversity are recognized as unsustainable agricultural land use for the needs of livestock and crop production. In marine ecosystems, this is the withdrawal of fish resources.

The leading role in implementing this policy, exercising control and monitoring belongs to national and regional authorities.

1) Industry analysis

Researcher Lienhoopa believes that the main problem in the management of ecosystem services is the interaction of the multiple actors involved in the management of ecosystem services [Lienhoopa et al., 2018]. This task is challenging because 1) the interests of the stakeholders differ depending on whether they consume or provide ecosystem services, and 2) there are many and often conflicting views on ecosystem services.

So, considering the results of the questionnaire through the prism of consumption or provision of ecosystem services, the following tendency is observed: it is assumed that the central goverment bodies (CGBs, departments) that determine the state policy for the conservation of natural resources are on guard against the deterioration of quality and quantity of nature, and representatives of the local executive body are their consumers.

In this context, the most significant concern is about the lack of involvement of state land administration authorities in environmental conservation issues.

In our opinion, the main reason that one in two representative of the land sector civil servant is sure that there is no need to include environmental aspects in sectoral programs and development plans is the agrarian orientation of state policy. As a department of the Ministry of Agriculture, a conflict of interests arises; on the one hand, they must use natural resources for economic activity, this direction is dominant, on the other hand, they must protect resources. [On approval of the Regulation ..., 2016; On approval of the State program ..., 2018]

In turn, according to the IPBES report [2018], the key factor in the loss of biodiversity and ecosystem services in Central Asia is the specific of land use.

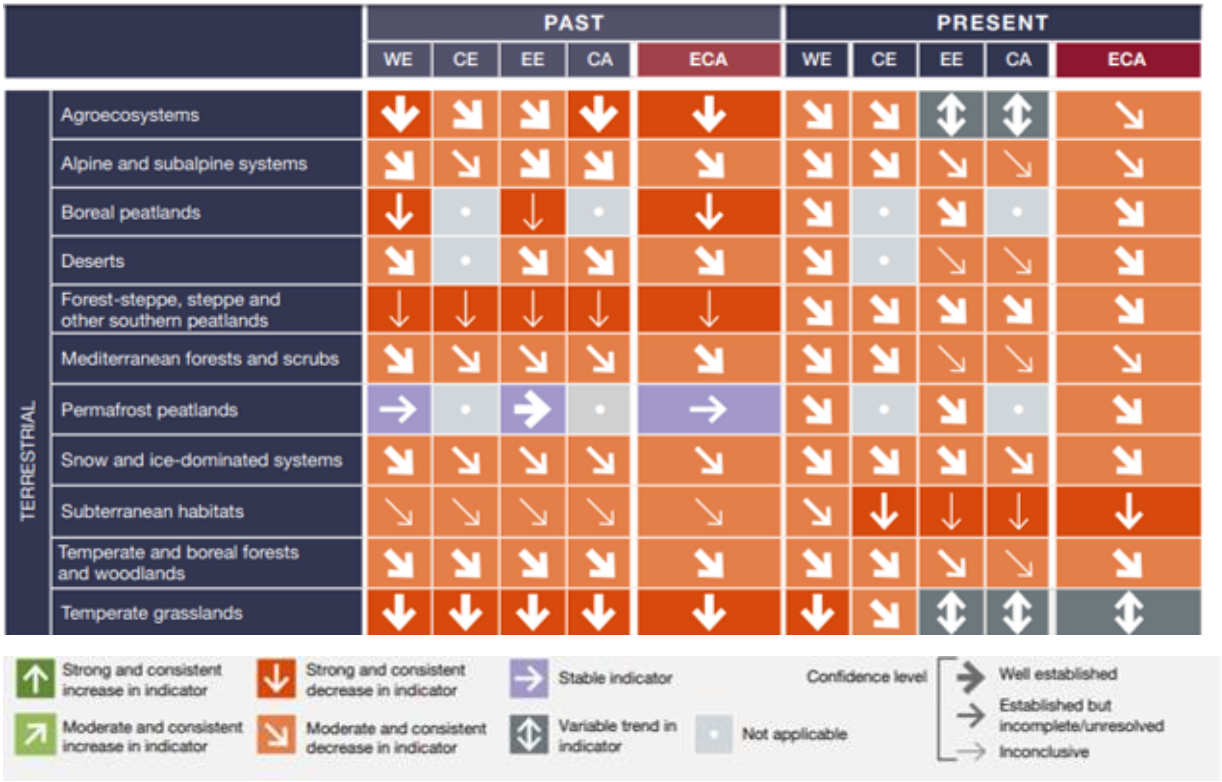

Figure: 13. Impact of indirect factors on the loss of biodiversity and ecosystem services in Central Asia 1950-2017. (Western Europe-WE, Central Europe – CE, Eastern Europe – EE, Central Asia – CA, (modified taking into account the IPBES report, 2018)

Indicators of the State Program for the Development of the Agro-Industrial Complex 2017-2021 on an increase of irrigated lands area, harmful subsidies of agriculture with the use of pesticides and mineral fertilizers have led to a decrease in biodiversity.

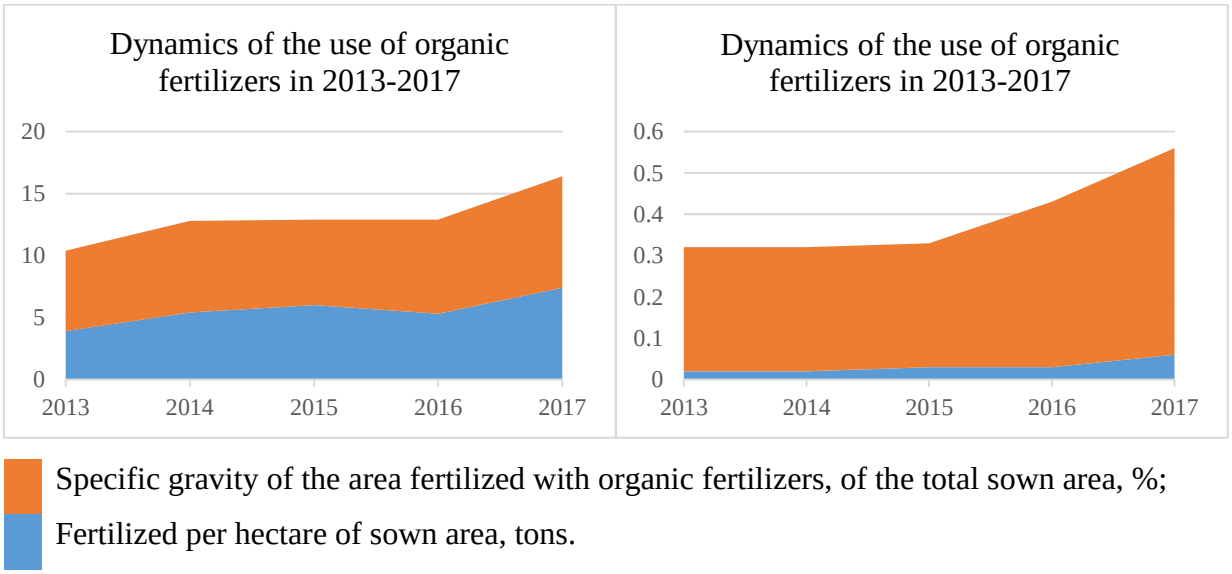

Figure: 14. Comparative dynamics of the volumes of mineral and organic fertilizers use in agriculture in 2013-2017.

Table 1. Volumes of subsidizing the production of mineral fertilizers in 2015-2021 Production volume, thousand tons

	Production volume, thousand tons	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
1	Nitrogen fertilizers	311,4	317,4	323,4	325	370	400	400
2	Phosphate fertilizer	90,1	96,4	225	500	720	800	1000
3	Complex fertilizers	0	0	0	0	2,6	5,2	7,9

The reliability of data on the achievement of planned targets is also important. According to the Plan of the implementation of the Agroindustrial Complex

Development Program for 2017-2021, from 2015 to 2018, it is planned to reduce the volume of losses during the transportation of surface water resources for agricultural needs from 5.1 million km3 to 4.02 million km3. While in Environmental indicators for monitoring and assessing the environment of the Committee of Statistics indicate that losses in the use of surface water by sectors of the economy for this period increase from 1.5 million km3 to 2.6 million km3.

Table 2. The volume of freshwater losses during transportation for irrigation.

		Unit	2015	2016	2017	2018
3	**Freshwater intake**					
4	**Freshwater intake (ground and surface)**	mln. м^3	**21661**	**21634**	**22454**	**23542**
6	water supply enterprises	mln. м^3	1994	1971	1944	2360
7	households	mln. м^3	740	424	403	172
8	agriculture, forestry and fishing	mln. м^3	13226	14705	15125	14968
9	manufacturing industry	mln. м^3	4884	1547	1598	869
10	electric power enterprises	mln. м^3	664	2450	2370	4069
11	other activities	mln. м^3	153	537	1014	1104
12	**Water loss - total**	mln. м^3	**1518**	**2517**	**2993**	**2554**
13	**Water loss%**	%	**7,01**	**11,63**	**13,33**	**10,85**
14	**Losses of water in the state enterprise of the agro-industrial complex**	mln. м^3	**5100**	**4240**	**4390**	**4020**
15	**Losses of water in the state enterprise of the agro-industrial complex,%**	%	**38,56**	**28,83**	**29,02**	**26,86**

Source: Committee of Statistics of the Ministry of National Economy

In turn, the activities of environmental authorities to increase the area of protected areas in developing countries are assessed by international bodies as ineffective. Only when protected areas are significant can they help prevent biodiversity loss.

Statistical data indicate an increase in the area of nature reserves and natural national parks from 6,483 hectares in 2015 to 7,404 hectares in 2018, while the total number

of PA (Protected areas) employees throughout the entire period remains unchanged 3,502 units.

Table 3. Dynamics of indicators of development of protected areas in 2015-2018.

	Name	2015	2016	2017	2018
1	**Number of protected areas, units**	27	27	27	30
2	**Area, thousand hectares**	6 483,7	7 039,5	7 039,5	7 404,1
3	**Number of personnel, units**	3 502	3 502	3 502	3 502

It should be noted that even the existing staff of protected areas is only 60% of the standard required to service the protected area.

The illegal extraction of natural resources is also a prime factor of pressure on biodiversity. The results of the questionnaire survey of representatives of civil servants responsible for the conservation of biodiversity and protected areas about the discrete role of the population (43%) in environmental conservation is explained by the fact that the effectiveness of their activities (KPI) assessed by the number of administrative penalties (fines, claims) taken against individuals [Code of ..., 2014]. It emphasizes sectoral policy towards detecting and suppressing, rather than anticipation and preventing violations.

2) Perceptions by levels of government

Considering the level of perception and motivation of decision-makers (DM) by levels of government, a qualitative analysis of the key factors influencing the choice of answers of respondents during the questionnaire was carried out.

It should be noted that 80% of the top-level executives at the regional level, who are confident in the dominant role of the authorities in the state of the environment, consider the lack of quality and reliability of available information to be the cause of ineffective management. This factor leads to a decrease in the effectiveness of managerial decision-making at the regional level. It should be noted here that local

government bodies do not have access to data from information systems for monitoring the state of natural resources.

Considering the difference in approaches to preserving the environment between the levels of government horizontally (CGB and LEB), it should be noted that the representatives of the CGB are more inclined (40%) rather than the representatives of the LEB (20%) to take into account the role of the population.

Next, we tried to find out how the level of state power (level of civil servants) effects on the assessment of the value of ecosystems (it's economical, ecological or another part).

The sectoral cut showed that the geological authorities give the lowest appraisal of the ecological value of ecosystem services, while the greatest importance is given to its economic value.

The country's state policy orientation on the extraction of the raw materials in order to obtain instant and short-term benefits brings to such results.

Vertical level

Factor analysis along the vertical cut of the assessment of the value of ecosystem services showed quite clearly that the LEBs are mainly interested in the priority of the social and scientific value of ecosystem services.

In our opinion, this reveals that LEBs have local knowledge, accumulated during life, which contributes to the formation of social needs of ecosystems.

Foreign researchers give particular importance to the knowledge gained from experience due to attachment to the place of long-term residence. People attach importance to this [Kudryavtsev et al. 2012] and feel a dependence on it [White et al., 2008].

The widespread implementation of the ecosystem approach is facilitated by the dissemination and development of local knowledge, as well as their inclusion in the development of government strategies and programs aimed at preserving ecosystems.

One of the important aspects will also be the development of domestic tourism in Kazakhstan, through which more and more people realize the importance of preserving the ecosystems of their native country.

The difference in approaches to environmental conservation issues can be explained by the fact that at the top level of government, state policy is formed in isolation from the lower level, where it is practically implemented.

The fact that about 80% of respondents, representatives of local executive authorities, confuse the term "ecosystem service" with the term "public service", and also do not see the relationship between ecosystem services and the ecosystem approach, indicates a poor knowledge of the legal and conceptual base and determines the practice of making decisions without ecosystem approach.

Here, the main reason lies in the transfer of a significant number of functions from the CGB to the LEB, carried out in 2014, which should have been accompanied by an increase in the level of knowledge of the basics of environmental legislation.

Table 4. Information on decentralization of government functions in 2014

Sphere	**Number and share of transferred functions from CGB to LEB, pcs.,%**	**The number of functions transferred from the LEB to lower level, pcs**
Land relations	**Total 20/31 (64%)** **Implementation - 12** **Regulatory - 1** **Control and supervisory - 7**	
Water resources		Regulatory – 1
Bioresources	Total **14/90 (15,6%)** Implementation - 7 Regulatory - 5 Control and supervisory - 2	**Total 1** Implementation – 1
Ecology	Total **5/70 [7,1%]** Implementation – 5	

The analysis of the results obtained also showed that in the course of the transfer of functions to the local executive authorities, no measures were taken to recruit qualified personnel, as well as the proportionate allocation of funds for the implementation of the newly assigned responsibilities.

A similar tendency can be traced at the stage of transferring the power of local executive authorities of regions to local executive authorities of districts, where the presence of their own budget for environmental purposes is not provided at all.

The results of a detailed analysis of the respondents' answers on the main criteria of the "green economy" showed a good understanding of the importance of accounting for natural capital in the interests of the country's economic development. This, most likely, is caused by the presence of the program for the country's transition to a "green economy" widely covered in the media.

The relatively large number of representatives of the state bodies of geology and subsoil use who found it difficult to answer, which are the most vulnerable in the transition to natural capital accounting, can be explained.

On the general background, when 14% of representatives of the CGB and local executive authorities believe that measures for investment in natural capital are not cost-effective, the results of 23% of the answers of CGB respondents in the field of environmental policy on a similar parameter look ambiguous.

This confirms the weak preparation and motivation of the authorized body in the implementation of the new state environmental policy.

Based on the processing of the research results, the following assessment of the influence of indirect factors on land use, forestry, the expansion of protected areas, the extraction of natural resources, and pollution was carried out.

Table 5. Assessment of the impact of indirect factors on environmental protection.

		Land use	**Water use**	**Subsoil use**	**Pollution**	**Extraction of natural resources**
1	**Institutional**	×	V	V	×	~
2	**Communicative**	×	~	×	×	~
3	**Motivational**	~	~	~	×	~
4	**Basic knowledge**	V	×	×	~	V

× negative ~ neutral V positive

Conclusion

Speaking of the results, our assessment showed the importance of the survey data obtained in the context of the current state of affairs in the system of public administration of natural resources.

The assessment of wildlife law, for example, classifies wildlife items in terms of usefulness, supporting harvesting processes.

In turn, considering the value of natural benefits through the prism of an ecosystem approach using the structure of ecosystem services will update the understanding of aesthetic, spiritual, health and cultural values.

Managing natural resources, with the right communications, will lead to more socially acceptable management options that reduce conflict, increase public support for managerial decisions, and ultimately enhance ecosystem protection.

The obstacles to the implementation of the ecosystem approach are caused, in our opinion, by the following factors:

1) lack of strategic environmental vision in public policy;

2) indicators of state sectoral programs are not coordinated and often contradict the goals of sustainable development;

3) the lack of a mechanism for interaction between government bodies of natural resources

4) the absence of an accessible Unified Information System, where all parameters of the state of natural resources are formalized;

5) lack of continuity between levels of government;

6) low use of the potential of local knowledge in the process of state planning and decision-making;

7) the absence of external stakeholders who will be both a source and a recipient of environmental information;

It is necessary to institutionalize mechanisms for mutual decision-making on natural resource management with the involvement of all stakeholders.

It is necessary to positively evaluate the contribution to the development of the ecosystem approach by decentralizing the powers of state bodies of natural resource

management and continue this trend by involving non-governmental organizations and the public in the decision-making process.

The successful implementation of the ecosystem approach lies in taking into account the interests of all stakeholders.

The development of integrated approaches in sectors of the economy will provide an opportunity for a more systematic assessment of biodiversity and ecosystem services for the benefit of people by public and private individuals.

It includes additional options for measuring national wealth beyond current economic indicators, taking into account the diverse values of nature.

Strategic environmental planning will provide a comprehensive set of incentives to support the transition to sustainable development.

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