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INPUT-OUTPUT ANALYSIS OF RECREATIONAL ASSETS WITHIN THE INCLUSIVE  
SUSTAINABLE DEVELOPMENT IN UKRAINE\*

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**Abstract.** This paper aims to develop approaches to accounting for recreational assets in the input-output model based on the analysis of the dynamics of their structure, as well as the structure of intermediate consumption of recreational services, on the example of intersectoral balance of Ukraine during 2012-2018. Based on forecasting the dynamics of indicators such as gross value added, consumption of fixed capital, net operated surplus, etc., optimistic and pessimistic scenarios for the development of recreation (arts, sports, entertainment and leisure) in Ukraine are identified, taking into account the factors of natural asset and the coronavirus pandemic. In particular, the net export indicator is expected to increase due to the restriction of international tourist arrivals and the formation of the domestic market of recreational services on the basis of inclusive sustainable development. Herewith, recreational and tourist enterprises have the following guidelines: security, quality, comfort, effectiveness of asset use. The expediency of state support is seen in the redistribution of the share of accounted natural assets between agriculture, forestry, fisheries and recreation, as well as in changing the structure of assets and intermediate consumption by reducing the share of public administration and increasing the share of other sectors, especially healthcare. The proposed organizational and economic measures complement the Strategy for the development of tourism and resorts for the period up to 2026 in Ukraine.

**Keywords:** recreation; assets; input-output analysis; nature; inclusive development; sustainability; Ukraine

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## 1. Introduction

Activization and expansion of recreational activity is one of the promising areas of sustainable development: effectively organized recreation and wellness of the population perform economic, social and ecological functions, as well as contribute to the formation of a healthy nation and thus the well-being of future generations. The main socio-economic result of the functioning of the recreational sphere is the restoration of labor potential, which increases the cost of human capital and is a catalyst for other activities in the structure of the national economy. Herewith the relationship between recreation and the environment has a bilateral nature: on the one hand, effective recreation is impossible without quality ecosystem services and, on the other hand, ecologically oriented recreation has minimal impact on the environment compared to other types of socio-economic activities.

The level of development of recreation is one of the indicators of the growth of the country's economy. Thus, in the United States, one of the most developed economies in the world, the outdoor recreational product in 2017 was 2.2% of GDP (U.S. Bureau 2019). In the structure of GDP of Ukraine, that is a developing economy, recreational product for the specified period was 0.4% (State 2018). The structure of recreational services also differs significantly: such popular recreational activities in the USA as boating, fishing, RVing, camping, ATVing, hunting and equestrian tourism, are not in great demand in Ukraine. A developed market for recreational services also helps to support the protection of ecosystems that attract nature tourism (Hjerpe 2018; Singalen et al. 2019).

The direct relationship between recreation and tourism, as well as resort treatment allows for the comprehensive implementation of the Sustainable Development Goals (UNWTO 2015; SDG 2017), namely: Goal 8 – inclusive growth of opportunities for employment and productivity, in the direction of promotion of sustainable tourism to create jobs and popularization of local culture, as well as ensure normal conditions for recreation for workers; Goal 12 – sustainable consumption and production, in the direction of rational use of natural resources in the field of sustainable tourism and recreation; Goal 14 – conservation of marine resources, in the direction of improving the safety and quality of recreation and the provision of maritime tourism services. Sustainable recreation (Selin 2017) complements sustainable tourism primarily in the context of inclusive development: in the ecological context – in providing equal opportunities and increasing access to a clean environment, which also serves as a tourist magnet, in particular, national nature parks; in the social context – to maintain at the state level social policy and preventive measures for mass wellness restoration of the population through the implementation of domestic tourism services; in the economic context – in the rational use of recreational assets to meet the broad needs of other sectors of the national economy and end consumers in recreation and health.

In conditions of a pandemic crisis, the role of recreation is significantly increased and transformed into a tool for activating the vital forces of the population to struggle with viral disease. Issues of social and environmental security increase attention to the conditions and measures of planning and organizing of recreation both within the green recreational areas and on the territory and in specialized premises of enterprises and institutions throughout the country. The priority of security is undisputed for the resumption of international tourism (UNWTO 2020). However, this process requires significant efforts and time, which shifts the orientation of the national tourism industry, at least until the end of 2020, in the plane of domestic tourism and its recreational function. Given the further lack of stability in the fight against the pandemic crisis, the shift to the domestic markets of tourism, recreation and resort business will become a strategic nature.

The relevance of the study of recreational assets of Ukraine is confirmed by current trends in the administration and development of tourism and recreation sphere in the country (Khumarova 2017) and, along with intra-

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regional and local strategies, the absence of a national program for the development of recreation as a full-fledged industry, rather than one of the additional functions of tourism or other areas of socio-economic activity. Thus, according to the Strategy for the development of tourism and resorts for the period up to 2026 (Strategy 2017), inter-sectoral, territorial and sectoral coordination of tourism and resorts in Ukraine focuses more on cognitive than recreational components, especially in combination with environmental factors. Moreover, the development indicators of tourism and resorts are focused exclusively on the tourist product without explanation of its recreational component, namely: the number of arrivals, the amount of revenues to local budgets from the payment of tourist tax, the number of jobs in tourism and etc. Along with this, the previous experience of Ukraine, namely the Crimea Development Program as a year-round national and international resort-recreational and tourist center (Crimea 2003) is a positive example of integrated development of recreation, tourism and resorts by creating a competitive recreational complex where the population in accordance with their needs is provided with sanatorium-resort and tourism services.

Despite the undeniable social and environmentally relevant importance of the field of organized recreation and wellness of the population, it is necessary to strengthen its economic justification, namely in the context of active use of its resources. The purpose of the study is to analyze the assets and economic results of operation of the recreational sphere in the structure of inter-sectoral relations of the national economy on the example of Ukraine, for identification of major challenges of accounting, use and distribution of recreational assets and substantiation of recommendations for solution of those issues at the national level.

## **2. Literature review**

Input-output analysis of the assets of the recreation sphere, first of all, allows to identify its role and place in the structure of intersectoral linkages of the national economy. Herewith, the following features of the application of input-output modeling and analysis in relation to recreation, adjacent industries and its sub-sectors and aspects exist. Thus, the input-output analysis of the tourism sphere from a methodological standpoint (Briassoulis 1991) has limitations on data accounting, taking into account the impact of tourism on other industries, not only in economic but also in social and environmental contexts. The use of input-output analysis in the recreational sphere in the coastal zone (Pomeroy et al. 1988) is associated with the justification of management decisions that take into account the dynamics of output, income, and employment. In the approximate valuation of environmental assets the method selected survey was used (Weber et al. 2002), in particular, on the willingness of respondents to pay for the protection of forests, primarily for their aesthetic value. Herewith, the factors of leisure were studied in the context of the formation of programs of inclusive recreation (Devine 2004).

Daniels (2004) used input-output model to analyze the socio-economic consequences of sports tourism on the basis of employment in those industries that have experienced a positive effect from the activation of tourism-recreational assets. Watson et al. (2008) also has conducted an input-output analysis of sports recreation, namely golf as an economic area that has a significant positive impact on the development of Colorado. A comprehensive research of recreational activities types and their impact on the regional economy, in particular, in the field of taxation, based on input-output analysis (Munn et al. 2010) allows to state that due to the development of fishing and hunting increase taxes mainly at local and state levels, and from wildlife watching – at the federal level (on the example of the Southeast US).

Within input-output analysis can be applied multidisciplinary approaches that take into account not only economic, social and ecological factors (Cherchyk 2008), as well as biological factors (Eiswerth et al. 2005). Specifically, the impacts of weeds on the economy (biological shock) due to the reduction of the duration of

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recreational services are considered, namely: direct impacts on spheres that are straightly related to recreation (retail, service sectors); indirect impacts on the economy as a result of directing additional costs to spheres that are straightly related to recreation; induced impacts as a result of changes in the structure of consumption due to direct and indirect effects.

In the recreational sphere, conflicts can arise caused by limitation of space within which the range of services in leisure and nature sport is provided (Mann & Absher 2008). The resolution of such conflict situations depends on the potential of natural resources, the set of social and economic interests in its use, as well as the effectiveness of recreational conflict's management processes. With a high demand for various types of outdoor activities, and therefore a significant ecological pressure on the natural recreational territory, it is extremely important to avoid and prevent additional social burden. Herewith, information about recreation as an economic activity, its structure and reflection of social, ecological and other data in it, is no less important for management decisions than the role of people who make them (Obst & Vardon 2014). It is about an integrated information approach that provides the possibility to account for, plan and forecast the sustainable development processes at the level of the national economy.

In the study of recreation in the context of inclusive development, it is advisable to assume that it is a relatively new stage in the evolution of sustainable development. An inclusive approach focuses on the social aspects of sustainable development. The "socializing" of tourism is to increase the accessibility of tourist and recreational facilities while maintaining their focus on the diversity of needs and interests of the population (Michopoulou et al. 2015). The spotlight should remain on the most pressing issues of inclusive tourism development, which are related to respect for individual independence, ensuring equal opportunities, accessibility in its broadest sense, and so on. The key to solving these and other problems is the cooperation of all stakeholders in the inclusive development of tourism and recreation.

Inclusive well-being, which also includes the recreational component, is seen as a criterion of sustainable development (Polasky et al. 2015): the level of sustainability is directly dependent on the size of all forms of capital (not only manufactured and financial, but also natural, human and social), which constitute the welfare of the population. It is important, herewith, not only to measure capital, which is impossible to do exactly at least in relation to its social and natural forms, but also to monitor the relevant signals that indicate the inclusion of these forms during the integrated assessment of the level of inclusive sustainable development.

Analysis of equality and fairness in the provision of opportunities for recreation in different regions (Flores et al. 2018) has allowed to identify unused recreational resources and to recommend their direction not only on a territorial but also on social criteria. Public lands should be used on the principles of social and environmental justice, which in turn has a positive impact on indicators of economic efficiency in the recreation and tourism sectors. On the example of national nature parks, which is located on the territory of forest and other recreational resources, we can see the uneven use of them, on what should be directed the management decisions in the implementation of state and regional environmental and social policies. Herewith the author (Kattumuri 2018) takes into account the impact of climate change on the environment and natural resources.

Poudel et al. (2018) carried out an input-output analysis of fishing as an important component of recreational economic activity. In particular, it was concluded that the economic contribution of recreational fishing depends on the availability of this activity. Recommendations for the inclusive development of the studied type of recreation relate to public investment in it. Herewith the government ability to influence can be understated (Ziegler et al. 2019).

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Petrushenko et al. (2019a, 2019b) have studied the factors of investment in the inclusive recreation sphere at the regional level and at the level of national nature parks. In this context, in the structure of recreational assets an important place is occupied by natural resources or more broadly ecological assets, which, however, are almost not taken into account in the system of national accounts. In particular, it is advisable to project into the plane of the recreational sector an approach to the consideration of environmental assets as a sovereign wealth funds in order to macro-economically stabilize and promote the conservation of natural resources for future generations (Niles & Moore 2019).

In Ukraine, the problem of recreation has been studied in the context of implementing the concept of sustainable development at the level of different ecosystems: urbo- and agro-ecosystems (Shevchenko et al. 2016, 2020), for improvement of the management structures of wellness recreation and, accordingly, to address the economic issues of recreational land use; mountain ecosystems (Malovanyy et al. 2019) for substantiation of the need to increase the level of environmental safety by assessing the quality of water, air and soil in the recreational area of the national park; small-cities as complex ecosystems (Kupach & Mykhailenko 2019) for the development of such types of wellness recreation as climate therapy, landscape therapy, sports recreation, cognitive tourism, eco-tourism, etc. Herewith, along with the concepts of “recreation”, “wellness recreation”, “wellness tourism”, other terms are used, in particular, “health tourism” in the description of which the complex of such factors as environmental, sanatorium and resort treatment, recreational nature use is considered.

Samona-Arvela et al. (2020) have studied the possibilities of diversification of recreation and tourism by landscape units, namely the following alternatives to their use as health and wellness, gastronomy and wine, walking and orienteering, etc. In general, a sound search has been performed for the most successful combination of natural and cultural recreation and sustainable tourism.

Along with this, the input-output analysis of recreational assets within the inclusive sustainable development requires further research.

The purpose of the paper is to develop approaches to accounting for recreational assets in the input-output model in the context of inclusive sustainable development, on the example of intersectoral relations of Ukraine's economy. According to the purpose the objectives are the following:

- justification of the inclusive approach to the recreation within the concept of sustainable development;
- comprehensive input-output analysis of the recreational sphere interaction with other sectors of Ukrainian economy in aspects of the formation of recreational assets and the output of recreational products;
- development of organizational-economic approaches to taking into account the recreational natural assets in input-output model, depending on the dynamics of the structure of recreational assets, and to support the implementation of relevant measures in Ukraine.

### **3. Research Methodology and Data**

Using the input-output model, the structural analysis of assets and services of the recreational industry was carried out in the paper in the context of its relationship with other sectors of the national economy, including consideration in the structure of recreational assets an environmental component (according to the classic input-output approach by Leontief (1986), taking into account the peculiarities of the transitive economy (Xu et al. 1992). The interrelation between the input-output model and the national income accounts also allows for an analysis of key macroeconomic indicators of the recreation industry and compare them with similar indicators of

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other sectors of the national economy, in particular, in accordance with official methodological provisions in Ukraine for input-output analysis (Methodological 2018), as well as (System 2017), as follows:

$$O_R = \sum_{j=1}^n IC_j^R + FU_R + NE_R,$$

$$I_R = \sum_{i=1}^n A_i^R + GVA_R,$$

where  $O_R$  – total output of recreational activity, at basic (current) prices;

$I_R$  – total input of recreational activity;

$A_R$  – assets of recreational activity (set from the input of other sectors on the formation of recreational product);

$IC_R$  – intermediate consumption of recreational product;

$FU_R$  – final consumption of recreational product;

$NE_R$  – net export of recreational product;

$GVA_R$  – gross value added of recreational activity.

Extrapolation analysis of these indicators allows predicting their dynamics for the short-term period 2020-2021. Herewith the forecast was carried out on two scenarios (optimistic and pessimistic), given the impact on recreation, on entire economy and on social sphere of the main factor during this period – the coronavirus pandemic.

Within the framework of the input-output model for the recreational sphere methods of structural and comparative analysis were applied: in the study of the balance sheet of recreational enterprises and comparison of the resulting structure of the balance of recreational enterprises with the economy as a whole; in the study of the dynamics of the structure of recreational product output (in the context of intersectoral interaction), and the dynamics of the structure of assets of the recreational sector (that is formed as a result of intersectoral interaction) and their comparison. Also, a statistical analysis of the dynamics of key indicators in the input-output model for the recreational sphere was conducted, namely: output at current prices, intermediate consumption, gross value added and others. The research scheme is shown in Figure 1.

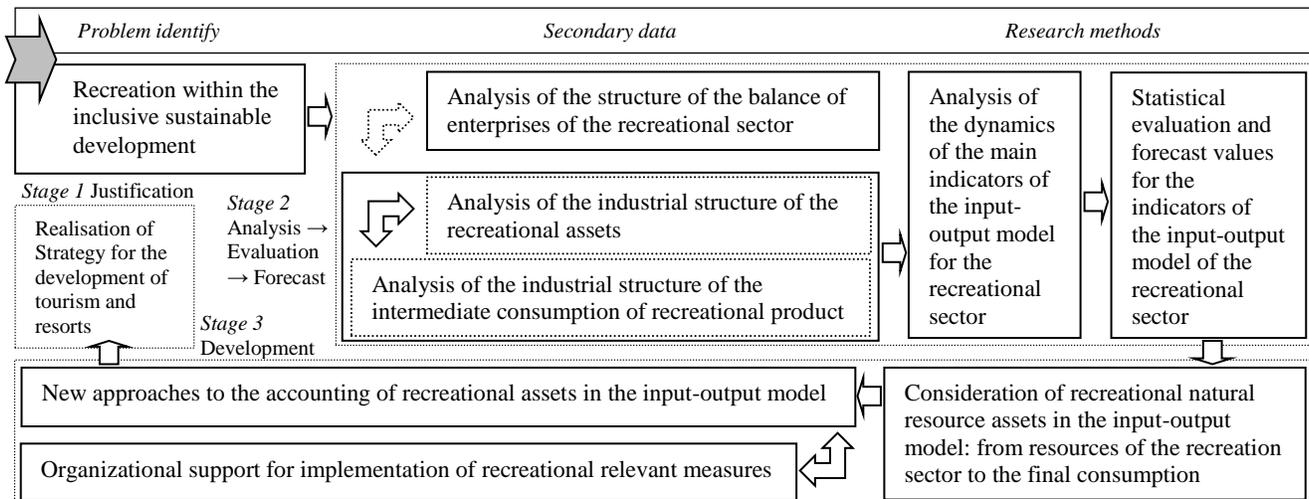


Fig. 1. Input-output analysis of recreational assets within the inclusive sustainable development in Ukraine: the research scheme  
Source: Developed by the authors

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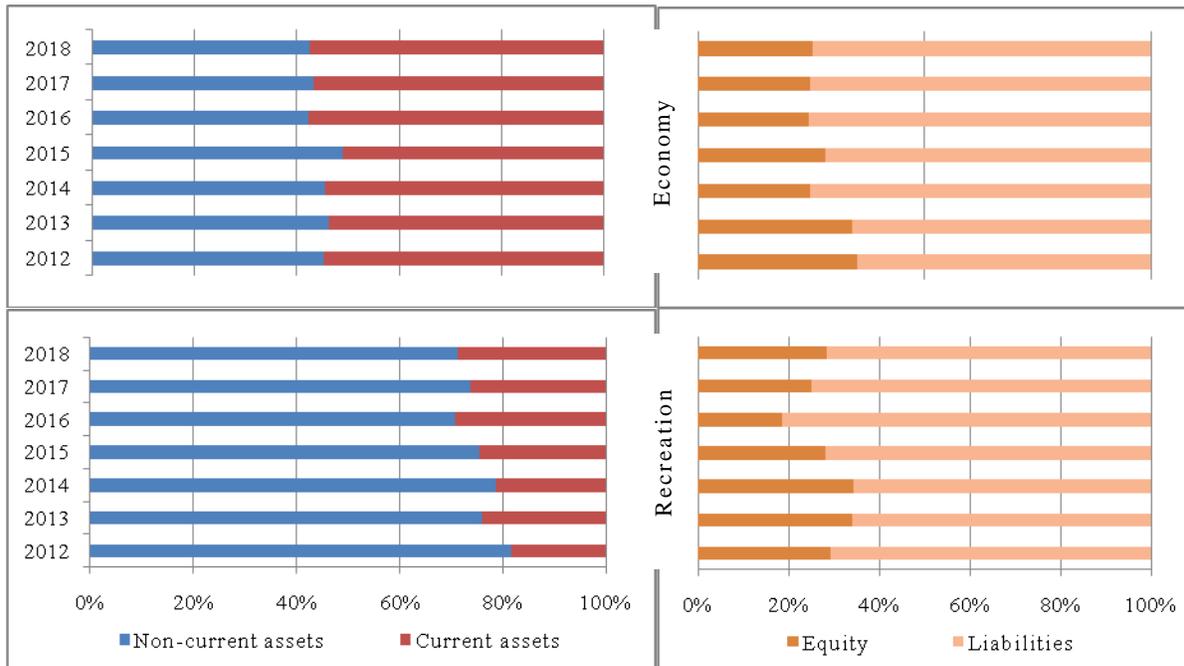
In the study input-output tables on a case of Ukraine's economy were used (State 2018, 2020b, 2020c). The focus of attention in the analysis of the tables was done to that data which describing the flow of assets and services between recreation and other sectors of the national economy during 2012-2018 years. The data for years previous to this period were summarized on a fundamentally different methodology and therefore cannot be taken into account in addition to the period 2012-2018. In the cells of tables that describe the data relevant to recreation, in the vertical direction assets of the recreational sector are presented, in the horizontal direction – the recreational services provided to other sectors of the economy and end users. To form a conceptual scheme for taking into account recreational natural resources in the input-output model, the practical implementation of which will allow the start of the realization of an optimistic scenario of forecasting the development of recreation in Ukraine in 2021, were used the materials of Crimean Development Program as a resort-recreational and tourist center (Crimea 2003), Tourism and Resort Development Strategies for the period up to 2026 (Strategy 2017), Association of Protected Areas of Ukraine (Association 2018) and U.S. Bureau of Economic Analysis (U.S. Bureau 2019), as well as the Ministry of Ecology and Natural Resources of Ukraine (Ministry 2020).

#### **4. Results**

In the context of inclusive sustainable development, the recreational sector has economic, environmental and social, as prioritized, targeted aspects, that requires further explanation: the needs of the population in health and recreation, which have increased under the influence of COVID-19, are of paramount importance for the state; the conceptual connection of recreation with nature components (so-called recreational nature management) is a prerequisite for increasing the role of environmental and natural-resource factors in the functioning and development of organized recreation; sustainability and support of recreation and tourism infrastructure is provided by the economic side of recreation as an important sector of the national economy. By analogy with the concept of sustainable development, inclusiveness is also multidimensional. In the context of this study, we were interested in economic inclusion as providing equal opportunities for those sectors of the national economy, the basis of the functioning and development of which, along with financial investment and human and social capital were natural resource assets; in particular, it was about recreational sector.

During the period 2019-2021 in the formation of recreational services in Ukraine, producers (recreational and tourism enterprises and organizations) have the following guidelines: security (especially important during a pandemic), quality (including the criterion of comfort, which is also actualized in the conditions of isolation under time of pandemic crisis), effectiveness (the essence of assets is to generate income that exceeds costs). The inclusive economic result of the recreational sphere and concomitant to it tourism and other sectors of the national economy is the total output of a recreational product that meets international standards of quality, environmental management and security. Changes in the structure of assets and liabilities of recreational enterprises (art, sports, entertainment, recreation) for the period 2012-2018 can be traced in Figure 2: on average, there is a decrease in the percentage of non-current assets (and, accordingly, an increase in the percentage of current assets), as well as a decrease in the percentage of long-term liabilities (and, accordingly, an increase in the percentage of current liabilities); the percentage of equity capital remains stable. Such trends indicate a gradual decline in the real estate fund in the recreational sector and general economic instability in the market of credit-financial services in Ukraine.

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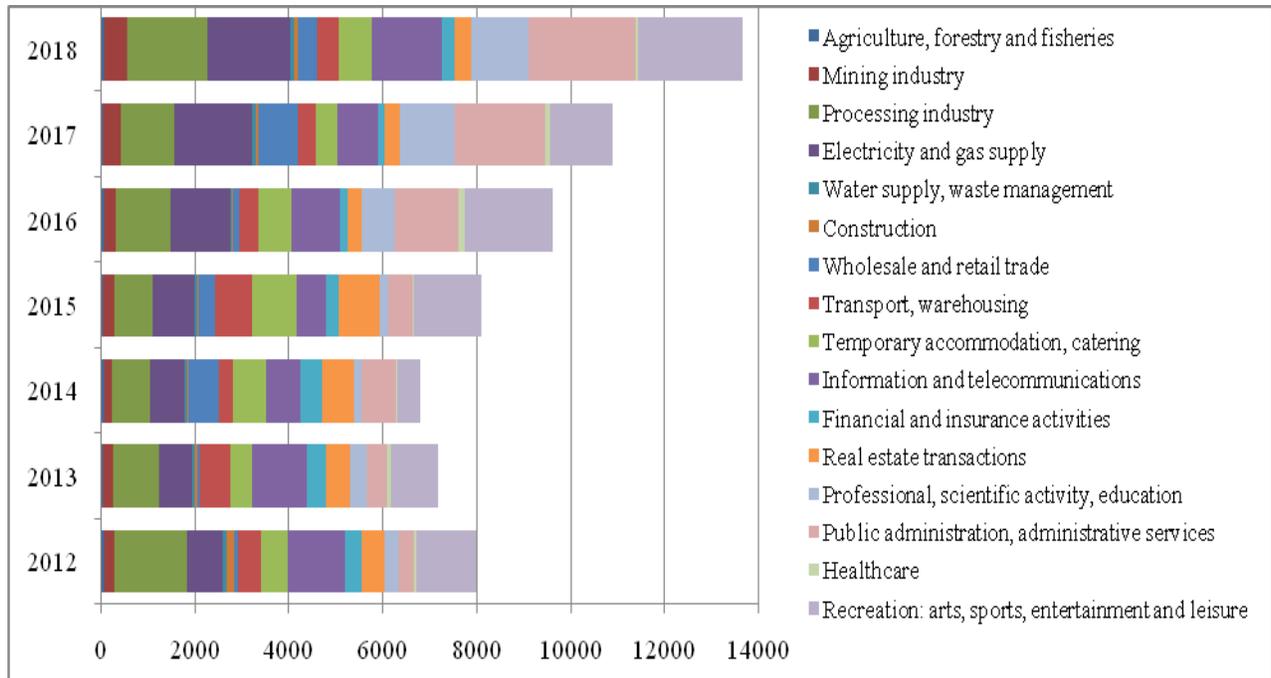


**Fig. 2.** The structure of the balance of enterprises is averaged over all types of economic activity and recreational sector, % at the end of the year

Source: Developed based State Statistics Service of Ukraine data (State 2020a)

Compared to the average profile of the structure of the balance of enterprises in all sectors of the economy (upper part of Figure 2), recreational enterprises have a much larger (approximately one and a half times) share of non-current assets, which indicates the availability of significant infrastructure and buildings as part of the recreational sector of Ukraine; however, the state of these assets is outdated. At the same time, the share of current assets is one and a half times smaller, which leads to an acute need for financial resources and, accordingly, affects the competitiveness of the recreation sphere. The structure of the balance of recreational enterprises is adequately reflected at the level of intersectoral balance. In particular, the share of assets formed from the input of processing industry, gas and electricity supply is quite significant (min – 10.19% in 2015; max – 19.58% in 2012; total recreational assets – 100%). The dynamics of assets distribution in the recreational sector in the input-output model during the period of 2012-2018 (Figure 3) indicates an increase in the share of services, in particular, professional, scientific activity, education (from 3.93% in 2012 to 8.95% in 2018), public administration, administrative services (from 3.94% in 2012 to 16.67% in 2018) and recreation directly (from 16.03% in 2012 to 16.41% in 2018). In general, there is an increase in total assets of the recreational sector in 1.7 times during the period 2014-2018 (from 7987 million UAH in 2012 to 13659 million UAH in 2018).

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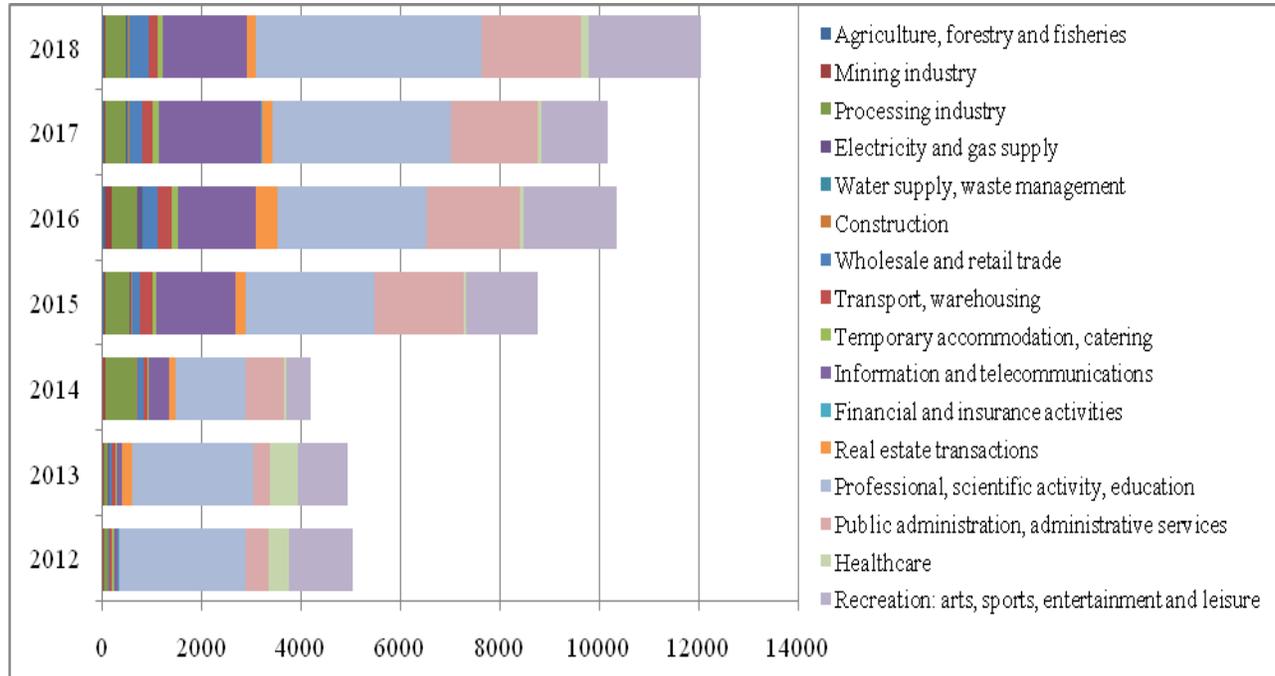
**Fig. 3.** Industrial structure of the recreational assets, million UAH  
 Source: Developed based on the State Statistics Service of Ukraine data (State 2018, 2020b, 2020c)

The total volume of intermediate consumption of recreational product (Figure 4) has the most value in 2018 – 12019 million UAH (5015 million UAH in 2012), also mainly due to professional, scientific activity and education (4553 million UAH), and also recreation (2241 million UAH), which together account for more than half of total intermediate consumption.

Combining the trends in the development of the recreational sector in Ukraine, presented in both figures (Figures 3 and 4), we note the following:

- relatively stable throughout all studied period is the trend of increasing assets and intermediate consumption for public administration and administrative services (4.23 times and 1.76 times, in 2018 compared to 2012, respectively), which simultaneously indicates about slowdown of development of the market of recreational services;

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**Fig. 4.** Industrial structure of the intermediate consumption of recreational product, million UAH  
 Source: Developed based on the State Statistics Service of Ukraine data (State 2018, 2020b, 2020c)

- the share of own assets of the recreational sector is almost unchanged (average value – 14.75%), while the level of its intermediate “self-consumption” is high (average value – 17.73%), which indicates a relatively significant government spending (absolute value of government spending on recreation or any other sphere of services in Ukraine, compared to the EU countries, is insignificant), however, the direction of which needs to be reconsidered: recreation should provide health restoration, wellness and recreation not “within itself”, but in other sectors of the national economy;
- the largest intermediate consumer of recreational product is the sphere of professional, scientific activity and education (average value – 37.95%), which again contradicts the principle of self-development of the recreational sector and focuses mainly on serving other social spheres that need significant state support. At the same time, assets generated as a result of reallocation of public expenditures spending from the scientific and educational sphere to the recreational sphere, although they tended to increase during 2016-2018, but are relatively insignificant (average value – 5.86%).

The overall economic indicators of the input-output model for the recreation sector (Figure 5) also show an upward trend: the output of the total recreational product grew more than tripled (from 9908 million UAH in 2010 to 34034 million UAH in 2018); similarly – gross value added (from 6074 million UAH in 2010 to 20375 million UAH in 2018) and salary of workers in the sector (from 4985 million UAH in 2010 to 17708 million UAH in 2018).

Unchanged is the tendency to decrease the indicator of net exports (–768 million UAH in 2012, –11133 million UAH in 2018). This is the only one of the presented indicators, the dynamics of which somewhat “mismanages” the overall picture of the sector. However, it reflects a much deeper problem: for Ukrainians the recreation is developing “outside the country”. To reverse this trend, the state should focus its efforts not on artificial

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redistribution of costs between sectors, but on supporting the development of the internal market of recreational services, increasing its competitiveness to the level of EU countries. And the situation of 2020 with the COVID-19 pandemic, paradoxically, can help to transform the imports into the growth of domestic recreational products.

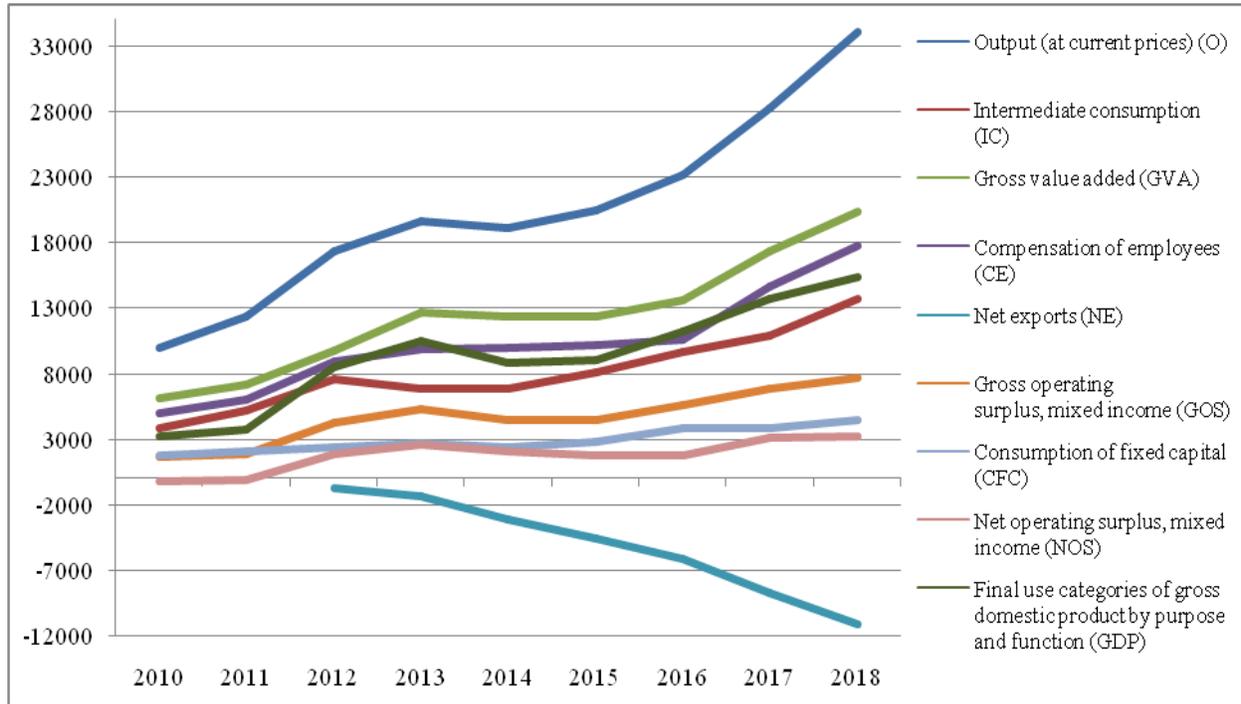


Fig. 5. Dynamics of the main indicators of the input-output model for the recreational sector in 2012-2018, million UAH  
 Source: Developed based on the State Statistics Service of Ukraine data (State 2018, 2020b, 2020c)

Based on the identification of trends in accordance with each indicator (function) in Figure 5, as well as the calculation of indicators for 2019, we identified optimistic and pessimistic scenarios for the recreation development in Ukraine (Table 1). The pessimistic scenario for the end of 2020 has been adjusted to take into account global negative trends in economic development, in particular, in Ukraine as a result due to the COVID-19 pandemic (International 2020). In this scenario, the output of a recreational product will decrease from 33530 million UAH in 2019 to 30948 million UAH in 2020; gross value added at the same time – from UAH 20337 million in 2019 to UAH 18771 million in 2020. According to the optimistic scenario, by the end of 2020, due to the development of the internal recreational market, despite the pandemic crisis, the trend presented in Figure 5 will continue. However, in both scenarios, given the forced uncompromising measures to isolate the territories, the same increase in net exports is expected: from –12115 million UAH in 2019 to –3635 million UAH in 2020.

The main disadvantage of the input-output model in the study of inclusive sustainable development of recreation is that it does not take into account recreational natural resource assets, which does not fully reflect the realistic situation regarding the state of the recreational sector as well as its impact on other sectors and the impact of other sectors of the national economy on it in the process of gross domestic product production. The main idea (based on the conceptual scheme of the input-output model on Figure 6) is that at the present stage of national accounts maintenance and compiling a cross-sectoral table in Ukraine, natural resource assets of recreation are not reflected in it; in the national accounts there are long-term biological assets, which in the input-output table are taken into

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account in the sectors of forestry, fisheries and agriculture. Herewith, recreational assets should be considered not only at the sectoral level (Shevchenko 2017) or territory level (Prokopenko & Petrushenko 2013), but at the integrated territorial-sectoral level.

**Table 1.** Functions, statistical evaluation and forecast values for the indicators of the input-output model of the recreational sector of Ukraine, 2012-2018

Function*	R <sup>2</sup>	F-Statistic	t-statistic	2019**	2020***	2020****	2021***
$O = 2613.5x + 7394.6$	0.93	F=88.97>5.59**** FDIST(88.97;1;7;1)=0.99	t=2613.48/277.07 =9.43>2.36*****	33530	36143	30948	38757
$IC = 1027.6x + 2916.8$	0.89	F=57.11>5.59 FDIST(57.11;1;7;1)=0.99	t=1027.55/135.97 =7.56>2.36	13193	14220	12607	15248
$GVA = 1585.9x + 4477.8$	0.92	F=78.31>5.59 FDIST(78.13;1;7;1)=0.99	t=1585.93/179.22 =8.85>2.36	20337	21923	18771	23509
$CE = 1341.6x + 3601.6$	0.88	F=51.55>5.59 FDIST(51.55;1;7;1)=0.99	t=1341.63/186.86 =7.18>2.36	17018	18360	15708	19701
$NE = -1743.7x + 5322$	0.97	F=186.48>5.59 FDIST(186.48;1;7;1)=0.99	t=1743.71/127.69 =13.66>2.36	-12115	-3635	-3635	0
$GOS = 682x + 1259.3$	0.87	F=46.05>5.59 FDIST(46.05;1;7;1)=0.99	t=682.03/100.51= 6.79>2.36	8080	8762	7458	9444
$CFC = 315.8x + 1329.8$	0.90	F=59.68>5.59 FDIST(59.68;1;7;1)=0.99	t=315.85/40.89= 7.72>2.36	4488	4804	4142	5120
$NOS = 1467.6 \ln(x) - 327.1$	0.75	F=14.56>5.59 FDIST(14.56;1;7;1)=0.99	t=366.18/95.97= 3.82>2.36	3048	3180	2813	3313
$GDP = 1364.1x + 2518.6$	0.87	F=46.05>5.59 FDIST(46.05;1;7;1)=0.99	t=1364.07/201.01 =6.79>2.36	16159	17523	14915	18887

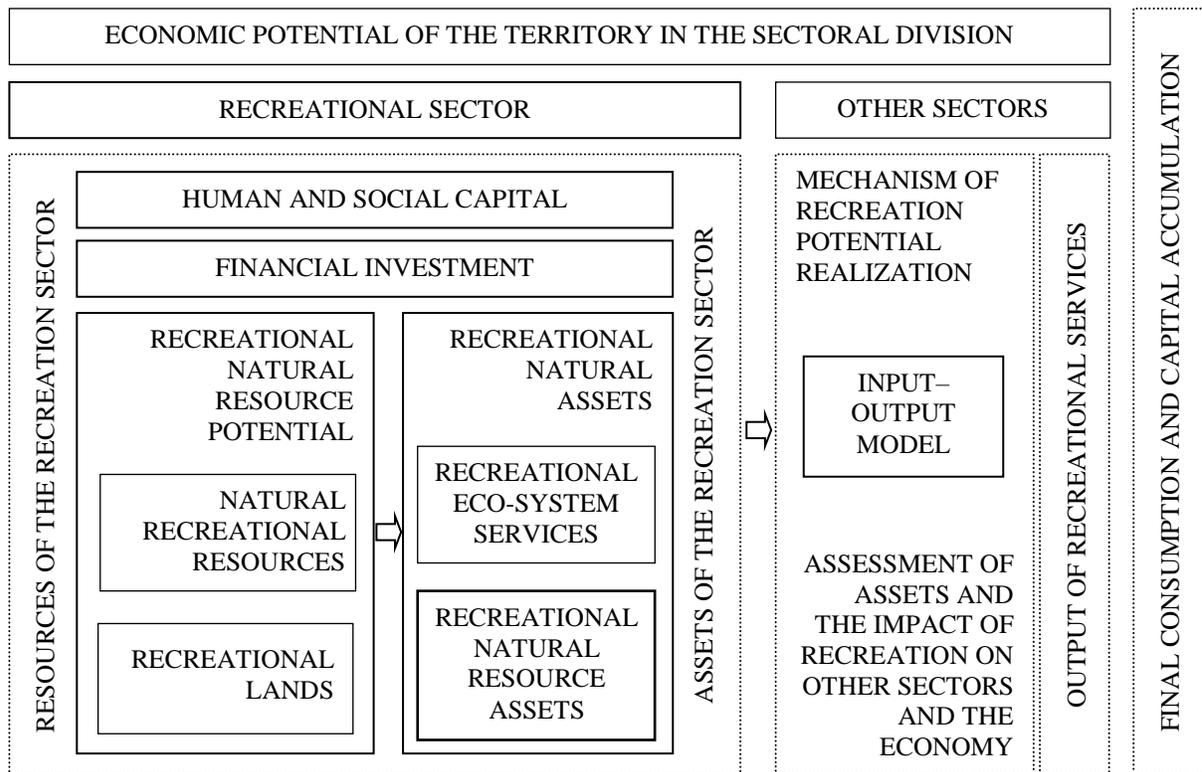
\*Where O – Output (at current prices), IC – Intermediate consumption, GVA – Gross value added, CE – Compensation of employees, NE – Net exports, GOS – Gross operating surplus, mixed income, CFC – Consumption of fixed capital, NOS – Net operating surplus, mixed income, GDP – Final use categories of gross domestic product by purpose and function; \*\*Realistic scenario: continuation of 2010-2018 trends, taking into account the stability on the market of recreational and tourism services; \*\*\*Optimistic scenario: continuation of 2010-2019 trends, but in contrast to the realistic scenario, the increase of the indicators mentioned above is explained by the projected development of the domestic market of recreational and tourism services in Ukraine, which is become possible as a result of emergence of such chances through isolation situation due to the coronavirus pandemic; \*\*\*\*Pessimistic scenario: violation of 2010-2019 trends, in contrast to the optimistic scenario, a decrease in the indicators mentioned above by an average of 7.2%, according to the IMF forecast for Ukraine’s economy (International 2020), due to the coronavirus pandemic; \*\*\*\*\*F<sub>cv</sub>(0.05;1;7)=5.59; \*\*\*\*\*TINV(0.05;7)=2.36  
Source: Calculated based on the State Statistics Service of Ukraine data (State 2018, 2020b, 2020c)

It is clear, that impact assessment process of the consideration of natural resource assets on of the structure of the intersectoral balance is associated with methodological difficulties, in particular, the valuation of those assets and so on. There is also a potential conflict in the distribution of natural resources (Petrushenko & Shevchenko 2013), which in the intersectoral context may become particularly acute. So, if long-term biological assets are on the balance sheet and, accordingly, recorded in the input-output table by forestry, agriculture and fisheries sectors, the reallocation of their part in favor of the recreational sector can cause intersectoral conflict situations. If the active part of natural capital will be included to recreational assets, which, due to shortcomings in the accounting of land or natural resources had not been taken into account at all in the input-output table, then this situation can also cause a conflict in the sphere of management of natural resources.

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Due to the consideration and involvement of natural recreational resources in the implementation input-output model, under the optimistic scenario (Table 1) the output of recreational products in the domestic market will continue upward trend to 38757 billion USD by the end of 2021 (107% of the projected output at the end of 2020), when achieving zero value of net exports indicator (within the management of export-import potential of the region (Gryshchenko et al. 2015).

Successful implementation of the proposed incorporation of natural recreational assets in the intersectoral balance is possible under the condition of comprehensive organizational-economic measures (based on (Crimea 2003), taking into account the temporary “spatial transformation” of the center of socio-economic relations “resort – tourism – recreation” in Ukraine) in the context of adjusting the Strategy for the development of tourism and resorts for the period up to 2026 (Strategy 2017), namely:



**Fig. 6.** Consideration of recreational natural resource assets in the input-output model

Source: Developed by the authors

- the creation of a positive image of the Ukrainian Black Sea region as a national and international resort-recreational and tourism center;
- the establishment of coordination relations between recreation, tourism and other sectors of the economy that will be affected by incentives for development, namely: transport, communications, trade, construction, agricultural industry;
- the clear definition of the status of resort and recreational areas; management of pricing for wellness-recreational services provided by sanatorium-resort facilities during the tourist season and off-season;

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- the creation of tax benefits for organizations of the recreational-tourism sphere, which use the profit for innovative and environmentally friendly development of material-technical base;
- the optimization of budgeting processes at the local level in order to develop the infrastructure of resorts, maintenance and arrangement of recreational areas, parks, beaches;
- state support to the arrival of cruise ships in Ukrainian seaports, development of sea and specialized types of tourism, winter recreation;
- the investment in the use of recreational-tourism potential of estuaries and areas around them, in particular, in increasing the number of resort-recreational facilities year-round operation (balneal and mud sanatoriums, aqua parks, swimming pools, fitness centers, etc.);
- the urgent construction of shore protection structures, implementation of anti-landslide and environmental protection measures, reconstruction of sewage treatment facilities.

Thus, we suggest the following new approaches to the accounting of recreational assets in the input-output model and organizational support for implementation of relevant measures in Ukraine:

- on taking into account in the structure of recreational assets the natural component (natural resources and ecosystem services) at a level that reflects the necessary socially significant contribution of the recreational sector to other sectors of the national economy and final consumption of recreational product. This level depends on the results of the analysis of the dynamics of the recreational assets structure, the intermediate consumption of recreational services structure, which are reflected in the intersectoral balance of the national economy, as well as the assessment of real use of natural assets for recreational purposes and their necessary use on the principle of inclusiveness;
- on the involvement of natural assets in the development of the domestic market of recreational and tourism services during the coronavirus pandemic, taking into account quality and comfort factors, within the proposed optimistic scenario (contrary to the pessimistic scenario, when organizational and economic measures fail to compensate for the negative effects of the pandemic crisis in the short term), according to which the positive dynamics of the recreational sector from 2010 to 2021 is maintained;
- on state support for the development of the recreational sphere, namely: declaring new rules of the game and organizational-economic measures in the Strategy for the development of tourism and resorts for the period up to 2026 in Ukraine, promoting engagement and accounting of inactive natural resources and redistribution of accounted natural assets in favor of the recreational sector, as well as increasing the assets of related sectors of the national economy, especially health care, to ensure inclusive sustainable development in Ukraine.

## **5. Discussion**

Ukraine has a significant untapped potential of natural recreational resources, which is concentrated primarily in more than 50 national nature parks: like nature reserves, they are of national importance, serve for nature protection functions and at the same time perform functions of organized recreational, wellness and tourism activity and have a high level of attraction in context of expansion of recreational demand for ecological and aesthetic types of tourism and complex health restoration. The transformation of recreational resources into assets of national nature parks is impossible without regulating their activities in accordance with the Laws of Ukraine (Law 2018; Law 2020). However, in practice a nominal activity to be seen or, more precisely, the absence of any activity on nature protection in national parks and, moreover, on the organization of recreation in them (Open 2020). “Devastating destruction of protected areas” of national parks is taking place: illegal logging, poaching, hawking due to hostilities in eastern Ukraine, total corruption (UNIAN 2016). Therefore, in order to start systematic measures to account for the recreational assets of national nature parks, it is necessary to assess the environmental and economic losses and improve the procedure for the application of appropriate penalties. In

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other words, making adjustments in the input-output model to take into account natural assets in the recreational sector will contribute to the stopping of the destruction of natural-recreational areas, especially within national nature parks, as well as to the reduction of the pollution and recreational loading.

The processes of formation and use of recreational assets of national nature parks must correspond to an inclusive approach in the social context. It is necessary to provide an equal access to the recreation area and the whole complex of recreational-tourism services of parks for any recreant, as well as to disseminate information about the benefits and gains of health recovery and recreation within the country using its best natural potential; naturally, subject to compliance with the norms of recreational activity, i.e. within the concept of sustainable development. It is also expedient to start an accounting for natural recreational assets in national parks because there is no such practice in these objects of the nature-reserve fund of Ukraine. Conditions are favorable for holding preliminary scientific and applied research, in particular, in the framework of comprehensive organizational-economic measures for the formation of infrastructure and development of recreational and tourism facilities located on the territory of national nature parks. Some of them, in particular, Carpathian National Nature Park, Holy Mountains National Nature Park, Shatsk National Nature Park, etc. (Association 2018) annually receive large flows of vacationers, due to the following factors: traditions and, consequently, the recognizability and high level of awareness of potential tourists, the succession of generations; the presence of elements of the experience economy, first of all, attractions of the “wow-effect” level, which can serve not only as a supplement to outdoor recreation, but as a major factor in deciding in favor of a trip to a national park.

To make appropriate adjustments to the input-output model, it is necessary to establish work on accounting for recreational assets in the form of complex satellite accounting, in particular, by example of Outdoor recreation satellite account by the Bureau of Economic Analysis of the U.S. Department of Commerce (U.S. Bureau 2019). An experiment can be started within national nature parks, then move to the regional level to take into account the wide range of recreational and tourism services provided using natural recreational assets, such as fishing, hunting, mounting, equestrian, rafting, rural tourism and others. In addition to the natural resource component, the satellite account of the recreation sector should include information in accordance with the industry composition of economic activity, which is directly related to the provision of recreational services, namely: arts, entertainment, accommodation, food services; transportation and warehousing; other industries.

## **Conclusions**

Recreation in its combination with the economy of natural resources requires an inclusive approach within the concept of sustainable development: social inclusion means the formation of recreational services within a recreational product available to all segments of the population, regardless of individual income; nature-ecological inclusion implies wide involvement of components of nature in the sphere of organized recreation and counteraction to various types of pollution of the recreational environment; economic inclusion means providing equal opportunities for those sectors of the national economy, the basis of the functioning and development of which, along with financial investment and human and social capital are natural resource assets.

Given the existence of a number of heterogeneous factors that affect the recreational sphere in Ukraine, a comprehensive input-output analysis of its interaction with other sectors of Ukrainian economy in two main aspects is needed: the formation of recreational assets and the output of recreational products. The results of the structure analysis of such interaction, as well as the dynamics of economic indicators of functioning of the recreational sector of Ukraine allows to state the following: along with financial and human assets, the natural assets of the sector are practically not taken into account; the sector is mainly subsidized and, accordingly, the

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market of recreational services is underdeveloped; intermediate consumption processes according to the traditions of the planned economy make the sector a “hostage” of the rest part of the public services sector, in particular, professional, scientific and educational activities, public administration and administrative services; during 2010-2018 there is a quantitative increase in indicators, but the quality of services and development of the sector compared to the best world experience is low. An inclusive economic approach, which involves the use of natural assets for the sustainable development of recreation, in the context of input-output analysis means the transformation of accounting for those assets in favour of the recreational sector, as well as accounting for previously unaccounted natural assets.

The novelty of the research is the development of organizational-economic approaches to: taking into account the recreational natural assets in input-output model depending on the dynamics of the structure of recreational assets, as well as assessing the necessary use of natural assets for recreational purposes on the principle of inclusiveness; involvement of natural assets in the development of the domestic market of recreational and tourism services during the coronavirus pandemic within the proposed optimistic scenario, which will maintain the positive dynamics of the recreational sector until 2021; state support for the development of the recreational sphere by promoting the involvement and accounting of inactive natural resources and redistribution of the share of accounted natural assets in favor of the recreational sector to ensure inclusive sustainable development in Ukraine. The research limitation is the lack of accurate data to assess the actual use of natural recreational assets, as well as the impossibility to improve the accuracy of the forecast for the development of the domestic market of recreational services in Ukraine due to the unpredictability of the scale and duration of the coronavirus pandemic effects.

The results of the study are of practical importance for decision-making on the development of the recreational sector in Ukraine, namely on the direction of short- and medium-term investments in the formation and use of natural recreational assets, both in optimistic and pessimistic scenarios given the consequences of the COVID-19 pandemic.

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