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Transition Model: to the Ecologically Balanced Development of the Ecosystem of Wellness Resort Territories

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Abstract. The article rationalizes theoretical aspects of balanced development of wellness resort recreational ecosystems. The wellness resort recreational ecosystem is specifically defined as a spatial system of interconnected ecological, economic and social components, which allows for more accurate elaboration of the methodology basis of the wellness resort stable development concept. The research has in focus the basic features of wellness resort balanced development and provides a characteristic of ecologically balanced recreational management of natural resources, analyzes and summarizes basic principles and specifics of recreational natural resource management. The methods applied include measuring recreational load and extent of recreational digression which were adapted for the current research purpose and resulted in defining the extent of recreational load and stages of recreational digression. A shift towards ecologically balanced development of recreational ecosystem has been proven to be an urgent need and may be achieved through applying the elaborated model and efficient policy targeting ecologically balanced development.

1. Introduction

Resource consumption by human beings is much greater than such reasonable for efficient biosphere management without disrupting its biogeochemical cycles and their resilience. However, the global economy development is getting more dependent on various ecosystems, including marine, forest and others which serve a source of primary material and energy inputs into economy. The increasing scale and intensification of the economic activity have been making biosphere less self-sustainable as a natural capital of the planet, which respectively causes destruction of ecosystems and loss of biological productivity. Accordingly, this results into inflation processes in the economy. A new methodological approach is required to avoid the negative consequences and to make a foundation of the cooperative coexistence of nature and economy. The latter is supposed to be oriented towards life preservation, i.e. ecologically balanced and providing for the maximum preservation of environmental resources for future generations. Since such environmental management is maintained due to energy and substance flow in space and time, a major goal on the way to the ecologically balanced wellness resort territory is its stability based on finding not solely economic factors but also factors providing for energy reconstruction in the environment.



2. Background

Today much attention is paid to the wellness industry which in its turn requires a thorough research of the conditions, specifics and factors influencing recreational processes, their regulatory mechanisms and strategy of wellness industry development. The latter should take into account spatial and territorial components and scientific findings in their complex integration. The lack of such research significantly delays transition to the ecologically balanced development of wellness resort territories which, as a matter of priority, requires ecologically balanced development of the ecosystems.

Transition to the sustainable economic development based on ecological integrity, social security and economic efficiency makes a global tendency being caused by reduction in biodiversity, ozone layer depletion, global warming, pollution of ecosystems and increased social differentiation within separate society segments and countries [1, 2]. The international experience proves efficiency of the national sustainable economic models combining economic, social and ecological priorities [3, 4].

Global ecological problems pose new challenges in terms of providing mechanisms to adapt economic activity to the recuperative capacities of the environment. Therefore, the ecologically balanced development of a wellness resort territory can be viewed as an optimal trajectory of human development that will further guarantee healthy environment and high standards of economy [5].

The functionality of the wellness resorts implies making conditions to provide wellness services to the population while observing strict requirements in terms of ecological safety standards and sustainable environment management and creating support mechanisms for such standards in the long term. One of the basic requirements to the wellness service lies in the high quality of its basic component, i.e. the wellness product. Hence, this presupposes availability of superior therapeutic and recreational effects alongside with natural healing resources and absence of harmful components in the product [6].

Today it is possible to assert with confidence that wellness resort territory development is becoming the core of further development of the human civilization, which requires elaboration of a new strategy of wellness resorts development based on the following principles [7]:

- integral development of wellness resort territories;
- hierarchal structure of wellness resort territories with manufacturing and infrastructural industries complying to the patterns of ecologically balanced development of the resort socio-ecological system;
- rational and sustainable environmental management;
- availability of environmental resources at a fee;
- the law of comparative advantages;
- growth and improvement of the wellbeing of the local communities at the wellness resort territories.

The category of the ecological balance shall be further explained in regards to the wellness resort territory. In so far as human activity presupposes economic processes, it also marks the point where ecological balance of the economy originates. Development of the wellness resort territory starts with the appropriation of its environmental elements, their use and reprocessing. Thus, an ecologically balanced activity is considered to be such that does not interfere with the exchange of energy, matter and information in the biosphere, i.e. it does not interfere with the energy reconstruction in the natural environmental subsystems and, hence, complies with the biophysical laws of their functioning [8, 9, 10, 11].

This study focuses on the development of certain elements of the transitional model to the ecologically balanced recreational ecosystem of the wellness resort territories.

3. Focus of the research

On a broad scale, modern recreational environmental management studies the planetary socio-ecosystem which includes a number of spatial components, i.e. socio-ecosystems of different localization. Natural and resource potential functions as the basis of their development as all its elements have a certain function in biogeocoenoses. Exclusion of a single element from this complex

process of exchanging energy and matter results in considerable loss of natural resources and leads to irreversible changes in the environment. Ozone layer depletion is responsible for global warming whereas climate on Earth getting warmer by one degree resulted into destruction of some labile natural systems in the tropics; deforestation lead to lower water levels in natural water bodies and, hence, desertification of large areas, etc. Thus, the natural and resource potential is primarily a reserve providing certain ecological benefits.

Successful transition of the national economy on the principle of sustainability will to a great extent depend on such transition on the regional and local levels. In this study a wellness resort territory as a form of spatial localization of the recreational socio-ecosystem is defined by the economic orientation of the environmental (recreational) management; the ecologically balanced development is possible due to partially operational laws: laws of recreational socio-ecosystems development and, above all, the law of recreational natural capital sustainability [12].

A wellness resort territory does not only include wellness facilities, but also their service enterprises and organizations. This territory's premises also have structures related to other economic segments, various administrative bodies and an active local community with its permanent residents.

The ecological development balance of manufacturing and infrastructural segments will depend on the acceptable capacity of economic activity characterized by the human load on the biogeocoenosis of the wellness resort territory within the maximum permissible limits and such that does not cause deterioration and degradation of the environment, but provides for the sustainable exchange processes in the environment.

Achieving optimal efficiency of wellness resort territory development as well development of its manufacturing and infrastructural segments while being ecologically balanced shall serve the economic basis of high level of wellness resort territory development within the frame of ecologically balanced economy and general progress of the civilization.

Such development is expected to be regulated by processing and analyzing the data reflecting current conditions and developmental perspectives. A wellness resort socio-ecosystem functions as a core of a wellness resort territory and is characterized by territorial and functional integrity. Such property necessitates spatial economic analysis of the wellness resort territory in order to define the controlling factors of its functioning, development and transformation [13].

Transition of Russia's economy towards sustainable development is expected to be evolutionary rather than revolutionary. This requires taking into consideration the institutional environment of the country and creating favorable conditions for ecologically oriented behavior according to the national specifics and historical background. Therefore, the primary challenge for strategic planning remains healthy environment for establishing the rules of behavior for the economic actors which would target control of the ecologically destructive anthropotechnogenic effects on the environment [14]. A workable solution can be found by applying the social networks theory according to which the behavior of the population can be changed by influencing its most active part. Therewith, state policy as for the ecologically balanced wellness resort territory development shall be focused on creating a modern efficient regulatory and legal framework corresponding to the world tendencies of wellness resort development and on providing ecologically balanced development of the recreational socio-ecosystems. These shall contribute to the coherence of the social, economic, architectural and economic aspects of the wellness resort territory development.

The priority areas providing balanced development include [5]:

- activation of the innovative and investment model upgrade of the wellness infrastructure, import substitution, technological upgrade of the major productive assets and energy efficiency in production processes;
- building a manufacturing model corresponding to the global trends and national priorities of sustainable development, i.e. technologically advanced, knowledge-intensive and commercially viable;
- setting up standards governing environmental pollution and environment-related tax rates complying to the international standards;

- enhancement of the budgetary discipline, optimization of the budget expenditures and improvement of the budget planning efficiency while financing eco-oriented manufacturing programs;
- harsher punishment for irrational use of all kinds of resources;
- spreading the most efficient technologies of industrial waste management;
- fostering of public and private behavior of employers and employees directed at the compliance with the balanced development strategy;
- maintenance of the industrial symbiotic parks working on the principle of waste-free production.

4. Solutions, results and recommendations

New scientific elaborations in the area of practical regulation mechanisms are required to provide for the modern methodological approaches to define certain patterns, parameters and criteria of the ecologically balanced development of socio-ecosystems. It primarily concerns elaboration of entirely new calculation methods of natural capital cost and economic evaluation of the natural recreational resources potential and potential of wellness resort territories.

The authors offer an algorithm of calculating ecologically permissible capacity of wellness resort territories presented in Figure 1.

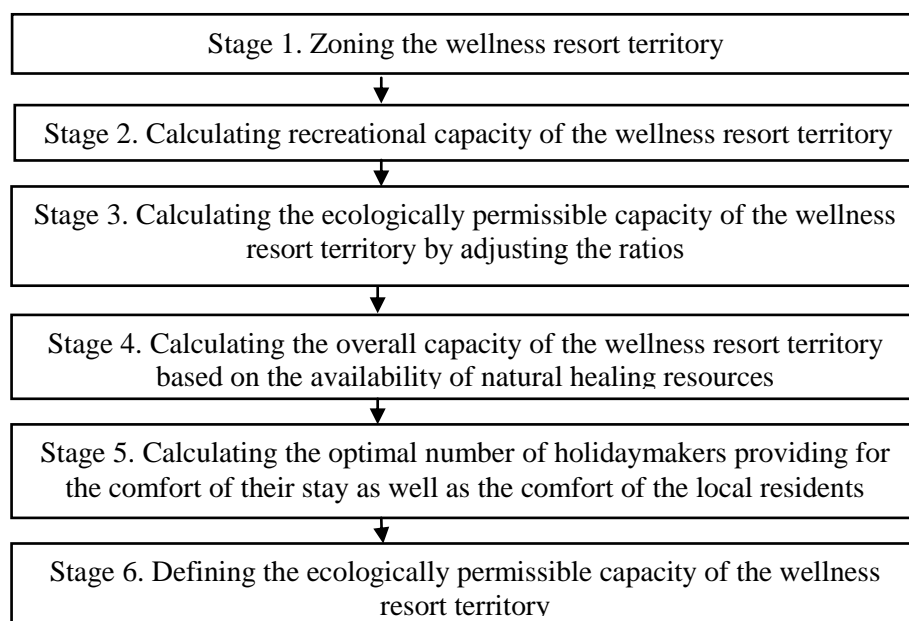


Figure. 1. Algorithm of calculating ecologically permissible capacity of wellness resort territories.

The absence of a common approach to the calculation of the recreational load standards complicates the process of calculating recreational capacity. This research is based on the approach suggested by Polish scientist D. Vyrzhikovskiy who presumes that recreational load standards depend on the natural landscapes, seasonality and functionality of the wellness resort territory [15 -20]. Thus, the ratios of recreational load for different natural complexes have been defined taking into account the abovementioned specifics and the factor of year-round holidaymaking.

Table 1. Standard ratios of recreational load on natural complexes and containing notes^a.

Natural complexes	Standard ratios of recreational load								
	Summer			Winter			Off-season		
	min	max	avg.	min	max	avg.	min	max	avg.
Coastal	300	500	400	60	100	80	180	300	240
Lakeside	80	150	115	16	45	30	48	97,5	72,5
Riverside	50	80	65	16	24	20	33	52	42,5
Lowland	80	120	100	30	50	40	60	145	70
Highland	100	150	125	40	60	50	70	105	87,5
Mountainous	110	200	155	60	160	110	85	180	132,5

^a Source: completed by the authors, based on [21; 22].

The recreational capacity of a wellness resort territory can be calculated for each season separately according to the formula below:

$$V_i = \frac{N_i \cdot S_i \cdot C_i}{D} \quad (1)$$

V_i is the recreational capacity of territory i, number of people;

N_i is the recreational load standard for territory i;

S_i is the area of wellness resort territory i;

C_i is the recreational period, days;

D is an average length of stay, days [24].

Ecologically permissible capacity of wellness resort territory (V_{ei}) is calculated on the basis of the V_i index and reflects the maximum number of holidaymakers staying on such territory at the same time together with the local residents without disrupting its ecologically balanced development. V_{ei} is calculated by adjusting the ratios [23] from formula (2).

$$V_{ei} = (V_i + N_p) \times k \times f \times g \times j \times q \quad (2)$$

V_{ei} is the ecologically permissible capacity of wellness resort territory i, number of people;

N_p is the permanently residing population of wellness resort i, number of people.

The following formula is used to calculate the capacity of a wellness resort based on the availability of natural healing resources:

$$M_{ei} = \frac{P_{ei}}{N_{ei}} \quad (3)$$

P_{ei} is availability of natural healing resources at wellness resort i;

N_{ei} is the consumption rate of natural healing resources per one holidaymaker a day at wellness resort i.

M_{ei} is the maximum capacity of resort i functioning on the basis of natural healing resources and limited by their total ecological availability.

This index is the maximum restraint of the wellness resort territory according to the criterion of ecological availability of healing resources. Having enough empirical data may allow calculation of the maximum capacity of a wellness resort based on ecological availability. Another factor important for the wellness resort territory targeting the best conditions for recreational activity and wellness service is the optimal number of holidaymakers which does not cause psychological discomfort or emotional strain (O_{ei}).

Owing to the stochastic dependence of the psychological comfort of a wellness resort territory (O_{ei}) on a significant number of factors, calculating its value may present certain difficulty. Inasmuch a specific methodology has not been yet elaborated, the findings of a separate sociological research on the holidaymakers of a particular wellness resort territory can be acceptable as long as it reflects personal satisfaction with the stay and recreation at a resort as well as the level of satisfaction with different aspects of stay, treatment and rest.

According to the suggested approach the permissible capacity of a wellness resort territory (center) is defined by the smallest value among the indices: M_{ei} is the capacity of a wellness resort territory (center) based on the ecological availability of natural healing resources; V_{ei} is the ecologically permissible capacity of a wellness resort territory (center); O_{ei} is the number of holidaymakers allowing for the comfortable conditions for themselves and local residents [24].

Mathematically this dependence can be presented as follows:

$$\min \{M_{ei}, V_{ei}, O_{ei}\} \quad (4)$$

The above methodology of calculating ecologically permissible capacity of wellness resort territories (wellness centers), formulae of ecologically permissible capacity and optimal number of holidaymakers are expected to better show restrictions of ecological load on the ecosystems and contribute to their ecologically balanced development provided recreational load standards on natural complexes should be elaborated. The idea of national economy transition to the model of sustainable ecologically balanced development of wellness resort territories involves a whole philosophy of balanced social, economic and ecological development of the nation set within an adequate legal framework and characterized by clear-cut principles, goals and institutional arrangements.

The main goal of such transition is achieving high living standard today and in the future (which also includes environmental protection and reconstruction of the natural ecosystem accompanied by the rational use of natural resources).

A number of stages indispensable for meeting the set goal are presented in Table 2.

Table 2. The main stages of a wellness resort territory transition to the ecologically balanced development.

Stage	Characteristic	Result
Stabilization	At this stage premises for further sustainable ecologically balanced development of wellness resort territories shall be created; the public opinion of the national development shall be based on the Rio Declaration on Environment and Development containing basic environmental law principles. Economic and social problems hindering ecologically balanced development shall be viewed from a new perspective. The total of these steps is supposed to allow for healthy environment and natural resources management.	Intensive consumption of natural resources as the economic actors still deny their exhaustibility; ecological problems being ignored.
Preparation	Transition from active consumption of natural resources to the new ecologically balanced development of wellness resort territories; unanimity of views in the government and in the society and active involvement of civil society institutions for the purpose of efficient elaboration of Road Map foresight by applying the adequate tools. Elaboration and implementation of certain regulations in	Awareness of the natural resources exhaustibility; searching for new models of environmental management; scientific research on environmental issues; necessity of government intervention in

	education, science and technology in accordance with the principles of ecologically balanced development of the territories. Maintenance of environmental health and efficient natural resources management.	order to minimize the negative load caused by irrational environmental management, develop a framework of transition to the ecologically balanced development of the wellness resort territories and target depletion of recreational load.
Transition	Structural and functional changes in the system: greener socio-economic relations; upgraded principles of ecologically balanced wellness resort territories development. Expected depletion of recreational load and resources use and, therefore, improved quality of life.	Elaboration of resource-efficient and energy-efficient technologies; benefits from the international experience in alternative sources application; research on effective environmental management.
Operation	Operational period of the ecologically balanced model of wellness resort territory development based on economical consumption of natural resources by the society and economic actors as an aftermath of mindset change regarding impact on the environment and resource consumption.	Spreading of the ideas of ecologically balanced development of wellness resort territories; the primary task is achieving ecologically balanced development of wellness resort territories.

All the stages have to be coordinated and supported at all levels of government. Transition from the first to the second stage is logically grounded as the negative consequences of the eco-destructive activity are well observed. The second stage comes with the increasing awareness of resource exhaustibility and damage to the environment caused by intensive human activity. At the next stage humanity understands the importance of establishing harmonious relations between society and the natural ecosystem. Thus, the stages of transition to the ecologically balanced development of wellness resort territories also show its general trajectory.

Providing ecologically balanced development of wellness resort territories, as a target for regional government, calls for rational and efficient policy which would stimulate environmental protection and would be based on the principles of goal-oriented planning, a sequence of achieved goals and adequate recreational load.

Figure 2 presents a model of transition to the ecologically balanced development of wellness resort territories elaborated by the authors.

5. Conclusion

We ascertain urgent necessity of practical transition to the sustainable ecologically balanced development of wellness resort territories on the basis of the elaborated model on the national level. According to our reckoning, such a model shall take stand on the following compulsory principle: official acknowledgement by the government that ecologically balanced development targets meeting the needs of the present generation and does not impede addressing the needs of the future generations.

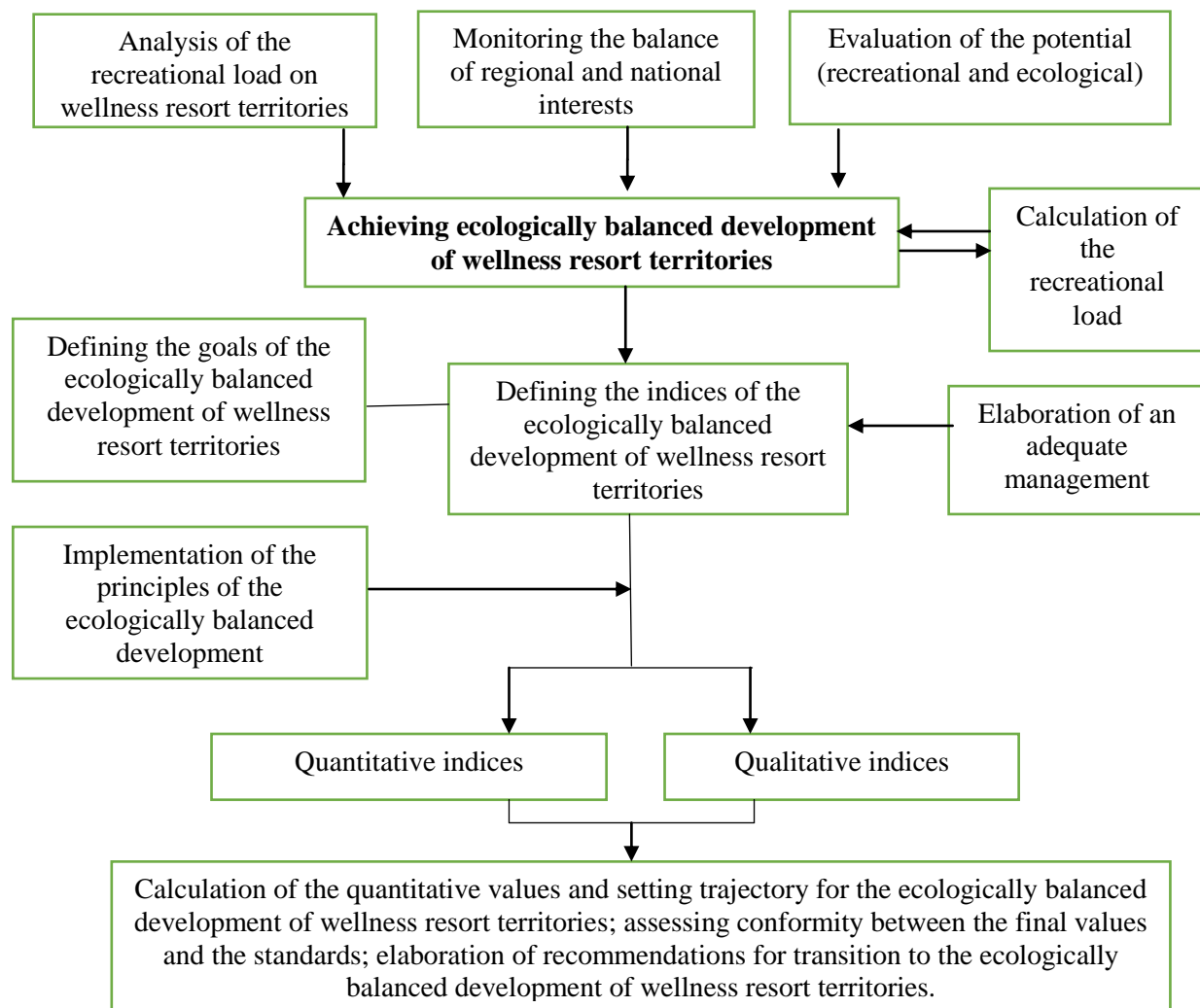


Figure 2. Achieving ecologically balanced development of wellness resort territories.

This requires acceptance of the fact that the natural resources owned by the people of the nation and providing material basis of their existence irrespective of form of ownership are exhaustible and their use has to be economical and based on knowledge-intensive approaches; any anthropogenic load has to correlate with the aspects of balanced wellness resort development and contribute to the ecologically balanced recreational management of natural resources.

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