

Optimizing a Network of Specially Protected Natural Areas as a Factor of Ecological Tourism Development in the Rostov Region

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ABSTRACT

The article is concerned with the economic and social factors of optimizing the network of specially protected areas of the Rostov Region and the development of ecological tourism in similar areas. The history of creating the network of protected areas in foreign and domestic scientific practice was reviewed, with the conclusion that the area of nature protection territories of different ranks demonstrates the development trends. The prospects for increasing the protected areas, including via arrangement of conservation parks of the local, regional, and national ranks in the world, Russia, and the Rostov region were considered. The network of protected areas of the Rostov region was characterized, and recommendations for its optimization, in particular increasing the number of protected areas, creating the recreational "green zones" in the urbanized areas of the south-west to smooth the negative effects of industrial production, and developing the park areas were given. The Don Delta was suggested as a possible territory for a landscape park, which in the future can claim the status of the national park, and the functions and structure of such establishment were pointed out. The need to optimize the protected area network in the Rostov region by organizing similar territories in all municipal entities was highlighted.

Keywords

protected areas, eco-tourism, conservation areas, nature reserves, national parks, regional economic development.

Introduction

Creation of the protected areas is one of the priorities of the eco-oriented society. Removal of the natural areas out of the economic use and transfer to the status of the protected areas allows to create conditions for the preservation of unique biogeocenoses and prevent the disappearance of certain species of flora and fauna from our planet.

Protected areas of each region tell on nature unique character of its eco-systems. The kinds of protected areas are presented as conservation areas (including biospheric), national parks, natural parks, reserves, natural monuments, geoparks etc [1]. In addition, these areas make a contribution to the improvement of the environment of human habitat and activity (here we can highlight the creation of green areas, city forests, resort areas, water protection, anti-erosion and other types of shelter forests) [2].

The creation of protected areas is a dynamic process, the different countries and regions of the world regularly plan the introduction of new areas and the network extension of existing ones, which serves the purpose of maintaining the ecological balance of the region. In the former USSR, new areas with rich historical and natural heritage are being rediscovered and opened to visitors after their significance has been proved by scientific studies [3]. The planning starts on the educational level: new ecological training courses are regularly introduced to students, the examples being the geoconservation courses in Romania, Portugal, Turkey, Croatia, Albania, and the UK [4].

To achieve these purposes, it is necessary to optimize the network of protected areas at the global, regional and local levels. With respect to Russia, the regional level can be considered as

the level of administrative subjects (regions, districts, republics).

The protected areas perform both environment-oriented and recreational functions. As a rule, such areas have resources for the development of eco-tourism. Under rational organization, eco-tourism can not only intensify the activity on protection of unique natural areas but become a "catalyst" for the development of tourism in the region and the economy as a whole.

The goal is to study the ways of optimization of the protected area network in the Rostov Region as a factor of the development of eco-tourism, as well as to develop recommendations on improving the regional network of protected areas.

In accordance with the goal to be sought, the following tasks were solved:

- give consideration to the history of studying the issues of optimization of the protected area network in the foreign and native scientific practice;
- analyze the development trends for the protected areas at the global and regional levels;
- study the protected area network in the Rostov Region, objective laws of its development and propose recommendations on optimization of the protected area network on the territory of Rostov Region;
- present an argument for the extension of the protected area network in urban areas of the region;

evaluate the economic and social effects of proposed recommendations.

Materials and Methods

The concept of this article lies in the fact that for the stable ecological development of the region, it is necessary to expand the protected area network of different ranks – from local to global ones near settlements being the sources of significant anthropogenic impact on the environment. The territory of the Rostov Region is a demonstrative example of similar regions where the percent of man-made landscapes is up to 90%. The development of protected areas gives a boost to activate all types of nature-oriented tourism, firstly ecological, provision the resident population with territories for recreation, physical and mental rest, and health improvement. In return, the development of eco-tourism will have a positive social and economic significance for regional development.

The study rests on provisions introduced in the papers of foreign and native authors. Modern approaches to the conservation of biodiversity by creating the protected areas on a world-wide basis are analyzed in classic papers of J. McNeely and K. Miller [5-6]. At the global level, the papers on issues of the article are presented by D. Fennel's comprehensive work on ecotourism [7] and monographs on the development of eco-tourism on the designated areas: the study of Wenjun Li "Ecotourism management in China's natural reserves" and the work of K.C. Anup "Eco-tourism and Its Role in Sustainable Development of Nepal", as well as the work of A. Devi carried out with the assistance of the World Commission on protected areas [8-10].

In native scientific literature, it is necessary to highlight the papers of N.V. Maksakovsky on the development of national parks in the urban areas of Russia, papers of N.M. Zabelina on similar issues and papers of G.V. Dobrovolsky, E.A. Belonovskaya, A.A. Tishkov, and others on the practical creation of protected areas in Russia and the recreational potential of such areas [3, 11-16].

The problems of the development of eco-tourism in the specially protected areas of the Russian regions are considered in the monograph of A.A. Zavadskaya and V.M. Yablokov [17].

In recent years, the issues concerning the problems of the article were raised in papers of E.I. Golubeva, N.I. Tul'skaya, A.V. Zavadskaya, E.S. Kashirina, I.M. Potravniy, V.V. Gassiy, R.S.M Al-Maleki [17-20].

The development problems of the protected area network and eco-tourism on the territory of the Rostov Region were taken up by N.G. Rodzianko, A.A. Gaidash, O.N. Fadeev, and E.O. Mudrova, V.A. Minoransky, as well as the authors of this article [21-24].

The research methodology for socio-economic efficiency in the field of recreation and tourism at the regional level is given, in particular, in the monograph of N.V. Rubtsova [25].

The research methodology supposes the use of the retrospective method that allowed us to analyze the history of the protected area development in Russia and the Rostov Region. The use of the chronologic method allowed us to make a spatial study of the unique landscapes of the district areas and their mutual spatial arrangement. The method of statistical analysis of the information was used when studying statistical indices concerning the regional industry of eco-tourism and hospitality, as well as the protected areas of the region, while the method of comparison study was used when comparing the unique development of the natural landscapes of the area being studied. When justifying the economic efficiency of the proposed park area, the method of economic analysis was used.

Results and Discussion

Based on the recommendations of the Caracas plan of actions, the percent of protected areas of each country from its territory shall be at least 10% [26].

There are more than 147,000 protected areas, the protected areas occupy an area of 19 mln km², which is 13% of the land surface. At the same time, more than 23% of the area of all protected is occupied by national parks.

State of protected areas in the Russian Federation

In the Russian Federation in 2017, the square of protected areas was 2.07 mln km², which is 11.4% of the country's square [15]. However, the annual total income from tourist visits to the protected areas in Russia is only \$0.01B per year (for comparison, this index is \$14.2B in the US). And there are 49 national parks with a total area of 140 ths. ha, which is 0.8% of the country's square and 6.7% of the square of all protected areas of the country. Note that the first national park in the USSR – Lahemaa was established in 1971 (almost in 100 years' time after establishing the first in the world national park -Yellowstone) on the territory that now belongs to Estonia. However, in the Southern Federal District, there exists only one national park – Sochisky in the Krasnodar territory; its area is 2086 km² (0.5% of the district's territory) which is the first national park established on the territory of modern-day Russia in 1983.

As seen, a part of national parks in the total protected area network in Russia is significantly less than on a global scale. The reason for this is that Russia puts emphasis, first of all, on the development of nature reserves. A.A. Tishkov underlines the following features of the development of Russian protected areas: asymmetry in the protected area network of European and Asian parts of Russia; differentiation in mean sizes and clusterness of the conservation areas (location of large, in terms of area, protected areas in the Arctic Region, Siberia, in Far East, and in mountains); the leadership of the regional protected areas as per the quantity and total squares, the formation of groups of subjects with the high percentages of the protected areas in the region's area (Yakutia, Far East, the North Caucasus Republics, etc.); the weak readiness of the

state-protected area system to the development on its basis of educational tourism, because even though as early as in 1920s educational tourism was considered as one of the destinations of the nature reserves, the most of conservation areas lack appropriate infrastructure [15].

However, as opposed to nature reserves where recreational activities are strictly limited, national parks may serve as the centers of tourist activities and as recreation areas for the residential population and visitors. This is very important for urban areas where the scale of man-made burden (including industrial pollution) gives a destructive influence on components of the environment.

The prospects of nature conservation in the Rostov region

In 2018, on the region's territory there were 82 protected areas of federal, regional, and local significance, with a total area of 233.29 ths. ha [27]. There are 4 areas of federal significance (the State nature biosphere reserve "Rostovsky", the State nature sanctuary "Tsimlyansky", the State nature sanctuary "Gornensky", the State nature sanctuary "Levoberezhny"), the nature park "Donskoy", 41 protected landscapes and 20 protected natural objects, 15 protected natural areas of local significance. In addition, the Rostov Region has two wetlands of international significance – the lake Manych-Gudilo and the storage lake Veselovskoe, as well as 3 important bird areas (IBA) with a total area of 4773 km² (477,3 ths. ha), which is 4.7% of the region's area. Thus, the total square of protected areas of the Rostov Region is 710.6 ths. ha, or 7.1% of the territory of the Rostov Region (Figure 1).

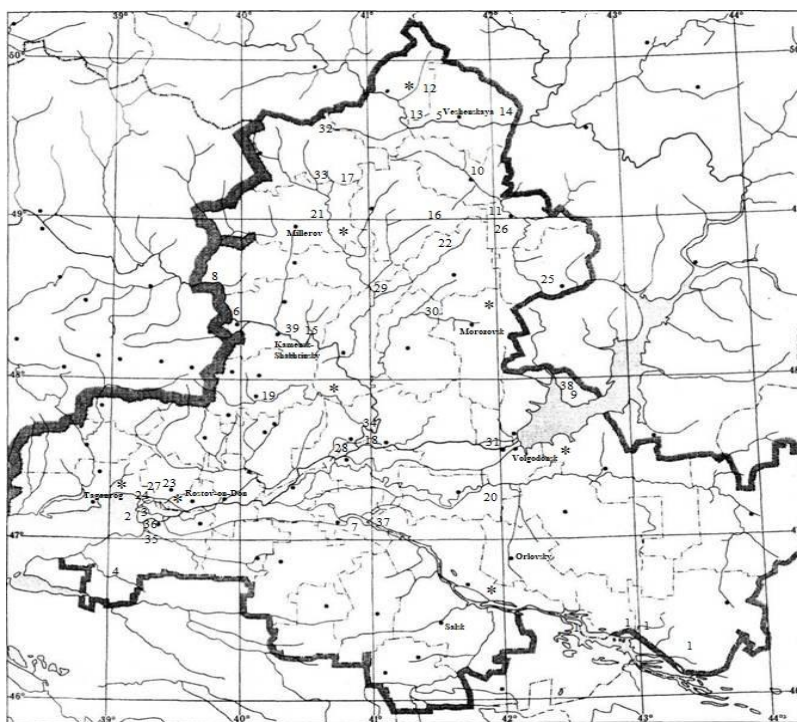


Figure 1. Location of Protected Areas on the Territory of the Rostov Region

Nature reserves, sanctuaries, IBAs of the Rostov Region:

1. State steppe nature reserve "Rostovsky".
2. Reserved fish space.
3. Azov area of the Rostov state research hunting entity (RSRHE).
4. Aleksandrovsky area of the RSRHE.
5. Veshensky area of the RSRHE.
6. Kamensky area of the RSRHE.
7. Manychsky area of the RSRHE.
8. Mityakinsky area of the RSRHE.
9. State nature sanctuary "Tsimlyansky".
10. Popovsky nature sanctuary.
11. Chistyakovsky nature sanctuary.
12. Bykovsky nature sanctuary.
13. Dubrovsky nature sanctuary.
14. Elansky nature sanctuary.
15. Severo-Donetsky nature sanctuary.
16. Verkhnesvechnikovsky nature sanctuary.
17. Vyazhensky nature sanctuary.
18. Avilovsky nature sanctuary.
19. Gornensky state nature sanctuary.
20. Martynovsky nature sanctuary.
21. Fominsky nature sanctuary.
22. Berezovsky nature sanctuary.
23. Shchepkinsky nature sanctuary.
24. Girlovsky nature sanctuary.
25. Chirsky nature sanctuary.
26. Chernyshevsky nature sanctuary.
27. State nature sanctuary "Levoberezhny".
28. Bugrovsky nature sanctuary.
29. Bolshinsky nature sanctuary.
30. Kachalinsky nature sanctuary.
31. Ostrovnoy nature sanctuary.
32. Zhuravsky nature sanctuary.
33. Zubrilinsky nature sanctuary.
34. Nizhněkundryuchensky nature sanctuary.
35. Nature park "Donsloy".
36. IBA "Delta Dona".
36. IBA "Veselovskoevodokhranilishche".
38. IBA "Tsimlyanskypeski".
39. IBA "Severodonetskaya".

* centers of planned recreational areas and parks

Today, the total area of protected territories of the Rostov Region is significantly less than the recommended values, but it trends upward (28% within 12 years) [28]. At the same time, the main territories are located in the southwestern, southeastern, and eastern parts of the region. For the highly urban territory of the Rostov Region (urbanization is 68%), the square of protected areas is insufficient.

Analysis of the structure of tourism routes of the Rostov Region points to the fact that nature-oriented types are about 26% and the percentage of eco-tourism is even less. Therefore, in our opinion, the development of protected areas, such as recreational ones from national parks to park areas of local significance, is of great relevance for the Rostov Region (Figure 2).

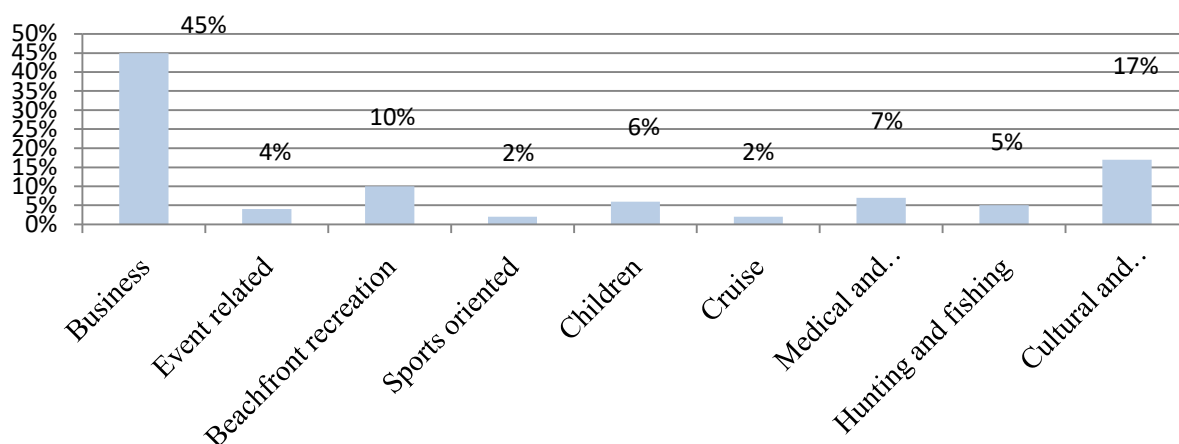


Fig. 2. Tourism Structure in the Rostov Region

The Rostov Region has everything necessary for further optimization of the protected area network. The Region is located in the south of the East-European flat land. The territory has significant resources of both natural and cultural-historical nature and is notable for a unique geographical location occupying practically almost the "central" latitudinal position between the Equator and the North Pole. The location in the area of the temperature zone (at the interface of arid and humid zones) makes it possible to avoid the extreme temperature indices and, as a consequence, raises the possibility of whole-year implementation of various nature-oriented types of tourism. The region has unique territories where it is possible to develop parks of regional and national status.

National parks present territories approved by the central authority where three main conditions must be carried out: full protection of nature, sufficient area, and established status. The national park territory is protected by a legal control excluding all types of human exploitation of natural resources and preventing any violations of the territorial integrity by human activities, but tourism is allowed and developed on it.

At the same time, national parks are developed by the decision of the Federal authorities and, as opposed, for example, to natural parks, they have the national level of management.

In such parks, it is possible to make ecological trail-ways, topic parks, ethnic villages, false Cossack settlements, recreational centers, etc. (as per sample of the existing landscape park "Loga" and recreational center "Eldorado" in the Kamensky district of the region). Being adjacent to territories with developed infrastructure, transport networks, accommodation means, such parks can become an element of developing tourism and recreation clusters of the region highlighted by the authors [29].

Such territories can give an opportunity for recreation for residents of Rostov mega-city and other cities, offer employment to the resident population, attract inbound tourists from other regions of Russia and the world.

The development of park areas in urban districts of the region is important today, which is confirmed by the draft Resolution of the Legislative Assembly of the Rostov Region "On the creation of the park-forest green belt around Rostov-on-Don and on its area" [30]. According to this project, the park-forest area, so-called "Green shield" is planned to be developed on the territory of 9.5 ths. ha near Rostov-on-Don. "Green shield" will pass within the boundaries of the city itself, as well as the neighboring territories – Bataysk, Novocherkassk, Azov, Myasnikovsky,

and Rodionovo-Nesvetaysky districts. At the same time for more balanced ecological development of the South-West region, it turns out to be possible the expansion of landscape-nature part up to 100 ths ha with the scope of the territory of above-mentioned Azov, Myasnikovsky as well as Neklinovsky districts. As time is extended, this part may become a national park.

The Don Delta National Park: a project

We offer the territory of the Don Delta as a territory where the national park can be developed. The territory covers the geographical area of the Don Delta and the adjacent area of the Don flood-way. On the given territory there is a significant number of delta arms, shallow channels, lakes, fish ponds. The large areas are occupied by reeds. The Delta significantly determines the fish resources of the Don and the Azov Sea, as many fish species reproduce themselves and pass the winter here. The territory of the Don Delta is on the flight path of many birds and more than 100 species of birds nest here. Among the representatives of flora and fauna, there are some species that are declining.

It turns out to be possible to develop the national park "Delta Don" on this territory. Currently, the potential territory core of the part is located in the protected area of regional significance – the nature park "Donskoy". It is adjacent to the unique objects – the archaeological museum-reserve "Tanais" (a monument of an ancient culture on the Don banks), Cossack village Starocherkasskaya with the monuments of Cossack culture of the Don, Cossack village Razdorskaya (the Razdorsky ethnographic museum-reserve is located in this village). Therefore, it could be a natural ethnographic park, where the cultural monuments will be protected from harmful anthropogenic influence, e.g. the impact of transport vibrations which has become a primary concern in numerous Russian cities [31].

Therefore, the territory proposed for the development of the "Delta Don" park in addition to its unique natural characteristics has resources for the development of educational and ethnographic tourism (Figure 3).

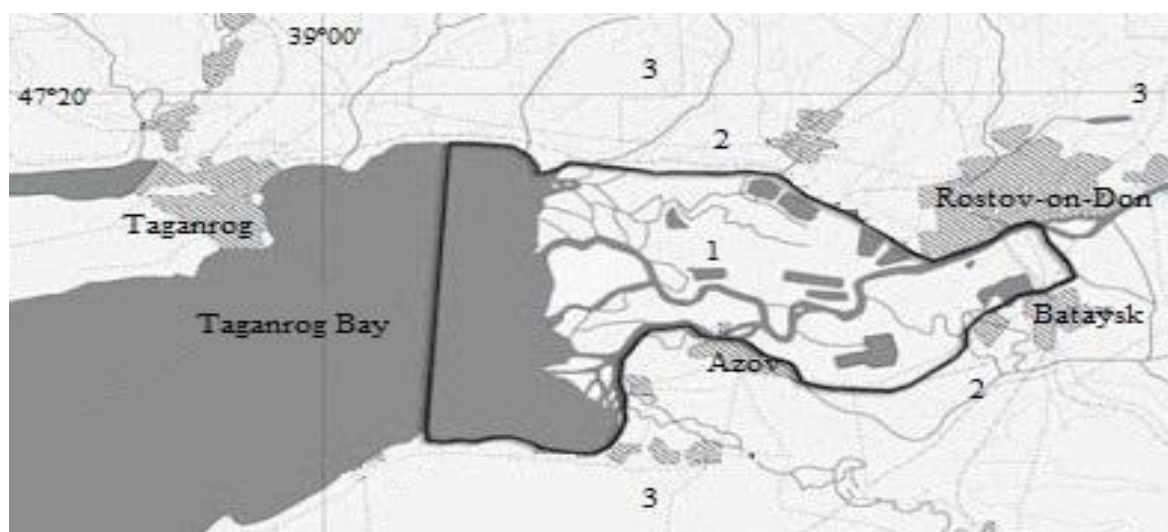


Fig. 3. Planned Areas of the "Delta Don" National Park: 1. The core of the "Delta Don" park; 2. Recreational area; 3. Protective area.

Such parks will carry out several functions: environmental protection, tourism, and recreation, research, information, education, physical culture, service, economic, and social functions (Figure 4).

The main visitors of the park are supposed to be residents of the nearest inhabited localities the total number of which exceeds 2 million people: tourists (firstly, lovers of a city break, backpackers, auto-campers), low-activity users (middle and advanced age people, families with children, physically disabled persons), lovers of nature, lovers of sport and outside activities (bikers, runners, fishermen, visitors to festivals, concerts, sporting events, physically disabled persons engaged in active sports), extreme sports enthusiasts.

Components of the "Delta Don" National Park	
→	recreation: ecological trails, terrain cure
→	excursion: excursion services (ecological and educational, scientific and educational, rider, biking tours, photo tours (hunting with a camera), birds-watching, exhibition halls
→	sport: playgrounds for volleyball, basketball, ping pong, arena football, orienteering, diving, child's playgrounds, Pump track, hike paths, the area with outdoor fitness equipment, gun club, darts
→	beach: equipped swimming holes on the bank of the Don, the swimming outdoor pool with the recreation site, air-solarium, beach volleyball
→	public catering: cafes, restaurants, stalls with fast food and drinks, wine-tasting room, BBQ area
→	accommodation means: hotels, camping with cabins, car parking space with tents, motel, flotel, hostels, tourist huts
→	transport: car and bike parkings, river and sea terminals, cable way
→	shopping: stalls with souvenir gifts, advertising and information materials, trade fair and exhibition
→	commercial: fishing, collecting mushrooms, berries, herbarium
→	leisure: the stage area, multifunctional gallery, pavilions, outdoor cinema, theme amusement park, mini zoo, relief map of the Rostov Region, green maze, theme park Rostov-on-Don in miniature
→	service: sanitary zone, centers of fast medical aid, police, rental centers for bikes, scooters, boats, canoe, kayaks

Fig. 4. Structure of the "Delta Don" National Park

It is supposed that any part of the park will be within 50-km distance from the urban settlements. The designated area is characterized by well-developed transport infrastructure, which can aid in an inflow of tourists from other regions. The Federal highway M4 "Don" runs through the west part of the region connecting it with Moscow and the south of Russia. The main railway line "Moscow – Rostov-on-Don – Caucasus" takes course near-parallel to the highway. The "Platov" international airport connecting the center of the region with 23 regions of Russia and 10 countries is located 30 km from Rostov-on-Don. The navigable path from the Don's mouth to the ports of the Azov, Black, and Mediterranean Sea is an addition to the transport network.

On the territory of the park, it is possible to develop the recreational area with accommodation means, including hostels and small hotels using "green" technologies, which have already been suggested as an effective solution for the development of the Russian hospitality sphere [23], rides, eco-routes. As an "educational" core, it is possible to develop a reduced copy of Rostov-on-Don (similar to the "Mini Europe" park in Belgium) which compactly demonstrates the main attractions of the city. It is supposed that the development of the following eco-routes is possible: the ecological path "Migrating birds fly", walking routes, water routes on boats, kayaks, yachts.

It is possible to develop the children's health camps and carry out the thematic festivals (for example, "Bird Day"). In such a case, in accordance with the laws in force, the territory of the planned park will have all required functional areas: the preserved area where the economic and recreational impact is fully forbidden; the protected area which serves as a buffer for sites of the preserved area where the economic and recreational use is strictly regulated; the area of cultural tourism where it is possible to develop the different museums (for example, the museum of people of the Don, the museum of false Cossack village, etc.); the recreational area where it is proposed to lay ecological trails and develop areas for leisure; the protection area for historical and cultural sites which will include the territory of the archaeological reserve museum "Tanais", Cossack villages Starocherkasskaya, Razdorskaya, Azov, etc.; the area of services to visitors which will include hostels, accommodation means, places of a trade by souvenirs, information center for tourists and the area.

The development of eco-tourism, including its specialized educational activities in the protected areas of the urban territory of the region, besides of familiarization of the residential population and visitors of the region with natural and cultural places of interest can have a social effect. The action of the proposed national Park can contribute to the modernization of existing museums, the creation of new ones, environmental education of the population, and the development of educational programs for various social groups. It is important to interact with the education system bodies, in particular, to create specialized children's ecological trails. It is also necessary to intensify the work with the media up to the foundation of its own print edition of the national park.

Eco-tourism, developing on the basis of the network of protected areas in the Rostov Region, has economic importance and is an important aspect for attracting additional financial flows to the region. In turn, the development of the protected area network in the region is one of the necessary conditions for the development of eco-tourism and the transition to the "green" economy, the principle of which lies in resource-saving and eco-friendly production works, the improvement of the human well-being and the risk mitigation for the environment.

Eco-tourism should be considered in terms of stimulating the development processes of the Don regions. The development of eco-tourism in the Rostov region on the basis of the protected area network by creating the national park "Delta Don" can revive the economy of depressive, limited in development municipal districts of the region, establish the basis for social stability in village settlements. It should be noted that it is possible to develop the park areas of the local level around such settlements on the basis of the forming tourism and recreation clusters [32].

Preliminary calculation of investment for the development of the national park "Delta Don" on the basis of the protected areas of the Rostov Region has shown that it is necessary to attract about RUB18 bn or \$276.9 mln. The given investment expenses take into account the costs for construction of all components of the tourist and recreational park, arrangement of ecological routes with the purchase of touristic inventory and equipment. When the park is visited by up to 1.5 mln people per year, the expected payback period for the project implementation will be 9.5

years with an annual profit of RUB2.1 bln. The channels and forms of financial income from the development of ecotourism in the Don region include compensation for environmental management as deductions of tourism revenues to the local budget; provision of local preliminary services to travel agencies; employment (staff of travel agencies).

Revenues from the operation of the National Park on the basis of the protected areas of the Rostov region will be able to ensure the economic stability of the region by providing new jobs and increasing the flexibility of the labor market.

Conclusions

1. It is necessary to increase the number of protected areas on the territory of the Rostov region. Despite the positive dynamics (an increase in the area by almost 28% over 10 years), the development of a protected area network in the region is insufficient, particularly in urban areas in the South-West of the region. It is possible to smooth out the unfavorable environmental situation caused by industrial production and the presence of transport highways through the creation of "green zones" with the recreational function.
2. The development of eco-tourism on the territory of the region can be facilitated by increasing the number of forms of protected areas. In particular, it is recommended to develop the park areas in the districts with high population density.
3. The favorable combination of the Don Delta nature components and ethnocultural monuments of the surrounding territories can become the basis for the formation of the landscape park, which in the future can claim the status of the national park. It is possible to create ecological trails in the park, as well as recreational areas and objects of cultural and educational tourism, while the main functions will be environmental, tourist and recreational, research, information, educational, physical culture and sports, service, economic and social functions. Optimization of the protected area network in the Rostov region should also be carried out by organizing similar territories in all municipal entities. This will contribute not only to the preservation of local landscapes but also to the development of weekend eco-tourism within individual rural areas.

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