PROTECTION MODEL OF NATURAL RESOURCES BY INTEGRATION OF MANAGEMENT FUNCTIONS OF FISHING AND HUNTING AREAS

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MODEL ZAŠTITE PRIRODNIH RESURSA INTEGRACIJOM UPRAVLJAČKIH FUNKCIJA RIBARSKOG I LOVNOG PODRUČJA

Apstrakt

Ribarska i lovna područja u zakonodavnom, organizacionom i funkcionalnom smislu ispoljavaju veliku sličnost, koja proističe iz zakonskih definicija. Kvalitet upravljanje obnovljivim resursima u oblasti ribarstva i lovstva uslovljen je političko-zakonodavnim, ekonomskim, socijalnim i tehnološko-ekološkim parametrima (kategorijama) određenim širokim spektrom različitih interesa i potreba. Zato je veoma važno odabrati model upravljanja pomenutim prirodnim resursima koji može zadovoljiti više ciljnih grupa, a da pri tome bude efikasan i ekonomičan.

Cilj ovog rada je da se na realan i praktičan način prikažu kriterijumi i alternative za poboljšanje upravljačkih funkcija kroz model zaštite prirodnih resursa integracijom upravljačkih funkcija ribarskog i lovnog područja.

Kao polazni materijal u ovom radu korišćeni su zakonska i planska dokumenta iz oblasti održivog korišćenja ribljeg fonda i lovstva. Izvršena je višekriterijumska analiza na osnovu kriterijuma PEST analize u odnosu na moguće alternative (posebno ribarsko, posebno lovno, integralno upravljanje ribarsko-lovnim područjem). PEST analiza se zasniva na analizi eksternih uticaja (Političko-zakonodavna, Ekonomska, Sociološka i Tehnološko-ekološka analiza) koji utiču na izbor organizacionog oblika upravljanja ribarskim i lovnim područijima. Kao kontrolni metod korišćen je analitičko hijerarhijski proces (AHP), sa namerom da se utvrdi u kojoj meri eksterni kriterijumi okruženja deluju na izbor ponuđenih alternativa (Saaty, 1980).

Prema većini autora u Srbijii postoji potreba integralnog upravljanja vodnim resursima i vodoprivrednim objektima, koja bi kroz adekvatnu pravnu regulativu ostvarila svoj puni tehnološko-tehnički kapacitet, ekonomičnost, efikasnost i efektivnost. Srbija raspolaže velikim brojem reka, prirodnih i veštačkih akumulacija. Integralno upravljanje rečnim slivom pretpostavlja plansko upravljanje i izradu monitoringa baziranih na ekološkim karakteristikama i kontinuiranom praćenju biotičkih i abiotičkih faktora (Simonović i sar., 2005).

U Srbiji je ustanovljeno oko 300 lovišta, u kojima su uočeni kao najčešći nedostaci: nedosledna primena i nepoštovanje zakonskih propisa, monopolizam određenih organizacija i interesnih grupa, nizak nivo tehničko-tehnološkog i institucionalnog razvoja, nepostojanje dokumenta strateškog planiranja u lovstvu, nerazvijeni monitoring divljači i njihovih staništa Sa aspekta održivog upravljanja lovnim područjima osnovni ciljevi su: povećanje brojnosti populacije sitne i krupne divljači, poboljšanje polne i starosne strukture populacija, očuvanje retkih i ugroženih vrsta lovne divljači (Medarević i sar., 2008).

Radovi i dokumenta, kao i iskustva drugih zemalja upućuju na potrebu objedinjenog upravljanja pomenutim obnovljivim resursima.

Može se zaključiti da bi integralno gazdovanje ribarskim i lovnim područjima poboljšalo upravljačke funkcije, smanjilo troškove i povećalo efikasnost poslovanja. Sigurno bi pozitivno uticalo i na socijalni aspekt i promenu svesti u javnosti da ribolov i lov nisu samo socijalna već i značajna privredna kategorija. Integralnim upravljanjem ribarskim i lovnim područjima bio bi olakšan monitoring sa jasnijim i uporedivim rezultatima, a kontrola i korišćenje finansijskih sredstava bila bi neuporedivo bolja i racionalnija. U pogledu funkcionisanja stručnih i čuvarskih službi potrebno je izvršiti detaljnu analizu geografskog rasporeda, veličine i broja lovnih tj. ribolovnih područja, sa ciljem optimizacije upravljanja istim na ekonomskim i ekološkim principima.

Potencijalna korist za državu se vidi u smanjenju troškova uprave, pri čemu bi se mogli formirati regionalni centri na nivou jednog ili više područja, a koji bi služili za obuku kadrova, organizaciju monitoringa, reagovanja u akcidentnim situacijama i slično. Pre toga potrebno je zakonsku regulativu, a potom ribarska i lovna područja učiniti međusobno kompatibilnim.

Ključne reči: ribarsko i lovno područje, upravljanje.
Keywords: fishing and hunting areas, integration

INTRODUCTION

Fishing and hunting areas in the legislative, organizational and functional terms manifest great similarity that is derived from the legal definitions. The quality of renewable resources management in the field of fishery and hunting is conditioned by political and legislative, economic, social, technological and ecological parameters (categories) determined by a wide range of different interests and needs. Therefore, it is very important to choose the model of managing natural resources mentioned above that can satisfy many target groups and by doing so to be efficient and economical.

Besides legal formulations, for unified management of fishing and hunting areas it is necessary that the idea and functions of river basin are presented as the framework for spatial areas formation within the management of fishing and hunting areas. The aim of this work is to show, in a realistic and practical way, the criteria and alternatives for improving management functions through the protection model of natural resources by integration of management functions of fishing and hunting areas.

MATERIAL AND METHODS

As a starting material in this work we used legal and planning documents in the field of sustainable use of fish stock and hunting. Multi-criteria analysis was performed on the basis of PEST criteria analysis in relation to possible alternatives (separately fishing, separately hunting, integrated management of fishing and hunting area). PEST analysis (political and legislative, economic, social, technological and ecological analysis) is based on external influences analysis that affects the choice of organizational forms of managing fishing and hunting areas. Analytical hierarchy process (AHP) was used as a control method in order to determine at what extent external environmental criteria affects the choice of given alternatives (Saaty, 1980).

RESULTS AND DISCUSSION

In the Law on the protection and sustainable usage of fish stock and The Law on game and hunting it is defined: **A fishing area** as "natural or artificial fishing waters or its part which makes hydrological, biological and economic entity for protection and sustainable use of fish stock. Fishing area is assigned for using by a tender for a decade. User is required to obtain and bring the approval on the Program of fishing area management…"

Hunting area as "physically rounded geographical and natural environment which is established for the purpose of implementation of unique hunting policy, long-term rational management of certain game species populations and efficient in taking appropriate measures in the hunting grounds. The right on the hunting ground is given for a period of ten years, except in cases where the law provides otherwise. The implementation of objectives and measures for development of hunting and improving the condition of game populations is done on the basis of the program of hunting areas development…"

In the law, safeguarding of fishing area is defined as "taking preventive and repressive measures of fish guard service, which prevents performing actions on the fishing waters that are in accordance with the provisions of the law, **and for game guarding service**

to perform the protection and regulation of hunting ground, as well as breeding and protection of game in the hunting ground…”

According to the most authors (Bajčetić and Stojanović 2011) in our country there is a need for integrated water resources management and water management facilities, which would through appropriate legal regulations, achieve its full technological and technical capacity, economy, efficiency and effectiveness. Serbia has a great number of rivers, natural and artificial accumulations. Integrated management of river basin assumes planned management and creation of monitoring based on ecological characteristics and continuous monitoring of biotic and abiotic factors (Simonović et al , 2005.)

About 300 hunting grounds were established in Serbia. The most common deficiencies identified in those hunting grounds were: inconsistent compliance and contempt of legislation, monopolism of certain organizations and interest groups, low level of technical as well as institutional development, lack of strategic planning document in hunting, underdeveloped monitoring of game and their habitats.(Professional basis for the development strategy of hunting in Republic of Serbia, 2011). In terms of sustainable management of hunting areas the main goals are: to increase number of small game population, improvement of age and gender structure of population and preservation of endangered and rare species of hunting game. (Medarević et al., 2008.)

Papers and documents mentioned above, as well as experiences of other countries refer to the need of unified management of fishing and hunting areas. According to the experiences of the USA Federal Agency, natural resources in hunting and fishing should be interconnected and that is the reason why the integrated management plans for natural habitats of game, fish and wild flora are prepared.

Based on the results and studies of other authors, legally defined objectives in fishing and hunting, as well as experiences of other countries in the integrated management of these significant natural resources, the PEST analysis was performed in order to evaluate: political and legislative, economic and organizational, sociological, technological and ecological influence on organizational alternatives; fishing, hunting and integrally fishing and hunting area. In this analysis potential opportunities are marked as plus sign (+), threats minus sign (-), and influences of certain factors were estimated from 1 to 10. The importance of factors was evaluated with marks from 1 to 5 (Pfeifer, 2002). In this way we defined weights of influence in relation to offered alternatives.

Table 1. PEST analysis of influence on organizational alternatives of fishing and hunting areas.

FACTORS OF INFLUENCE	Possibility of threat (+ / -)	Influence of factors (1 do 10)	Importance of factors (1 do 5)	Weights of influence factors
ALTERNATIVE A - SEPARATED FISHING AREA				
Political and legislative		6	4	24
Economic and organizational		5	5	25
Sociological		-6	4	-24
Technological and ecological		4	3	12
			TOTAL	37
ALTERNATIVE B – SEPARATED HUNTING AREA				
Political and legislative	+	8	4	32
Economic and organizational	+	6	5	30
Sociological	-	-8	4	-32
Technological and ecological	+	6	3	18
			TOTAL	48
ALTERNATIVE C - INTEGRATED HUNTING AND FISHING AREA				
Political and legislative	+	8	5	40
Economic and organizational	+	7	5	35
Sociological	-	-4	4	-16
Technological and ecological	+	7	3	21
			TOTAL	80

According to the results shown in Table 1, the minimum value of weighting factors of influence are determined at the option of separate management of fishing areas (37). The maximum value of the weighting factors (80) is calculated for the option of integrated management of fishing and hunting areas. Limitations of external factors are the most prominent in the social segment, due to untapped opportunities in economic and organizational, technological point of view and especially the legislative-political, dominates the view that fishing and hunting are social , not economic categories ,whereby limiting impacts are the largest in hunting, and slightly smaller in fishing. It should be pointed out that insufficient influence of political and legislative solutions have not given an adequate response to economic and financial problems so far (Šarčević, et al., 2013.)

Table 2. Results of multi-criteria analysis of comparing alternatives in relation to criteria

ALTERNATIVES - Areas	CRITERIA - FACTORS OF INFLUENCE			
	Political - legislative	Economic- organizational	Sociological	Technological and ecological
Fishing area	0.2857	0.1593	0.3338	0.2721
Hunting area	0.5714	0.2519	0.1416	0.1199
Hunting and fishing area	0.1429	0.5889	0.5247	0.6080
TOTAL	**1.0000**	**1.0000**	**1.0000**	**1.000**

Table 2 shows the results of comparison, by AHP method, of management alternatives in relation to the set of criteria i.e. the results of criteria influence to the management concept of fishing and hunting areas. Regarding political-legislative criteria , integrated management of fishing and hunting areas has a very small weighting value (Wv = 0.1429), which can be interpreted as a consequence that lack of influence of the experts has on political and legislative as well as on administration. Inertness of traditional understanding of the significance of these natural resources has contributed to such a small value.

Paradoxically, the option of integrated management of fishing and hunting areas, has expressed values in three main components of the criteria above, but in political and legislative terms, that significance is negligible. It can be seen that the economic and organizational as well as technological and organizational criteria strongly and positively affect the social component, so political structures and legislator should pay more attention to that. In a similar way, by using AHP as a method, the analysis of influence of factors on work of professional and guarding services in fishery are performed. The results are shown in table 3.

Table 3. Vector of weighting value (Vwv) of the basic matrix of criteria

Criteria	Vector of weighting value (Vww)	Vector of weighting value (Vww%)
Number of sold licenses	0,4656	46,56%
Number of orders	0,1885	18,85%
The length of water flow–km	0,2772	27,72%
Accessibility of terrain	0,0687	6,87%
Total	1,0000	100,00%

From table 3 it can be seen that the percentage of vector weighting values (Vwv%) for the number of sold licenses is 46.56%, for the length of water flow 27.72% , for the number of orders it's 18.85% and 6.87% for the accessibility of terrain. Foregoing vectors of weighting value (Vww) in relation to particular objective, clearly position key factors for work of professional and guarding services in fishery. The analysis of influence of certain factors on work of professional and guarding services in hunting has been performed and the results are shown in table 4. From table 4 it can also be seen that the percentage of vectors of weighting values (Vwv%) for the criteria hunting area is 52.32%, for the number of hunters 22.89%, orographic conditions 15.53% and for the openess of the road network it is 9.26%.

Table 4. Vector of weighting value (Vwv) of the basic matrix of criteria

Criteria	Vector of weighting value (Vwv)	Percentage of vector of weighting value (Vwv%)
Hunting area	0.5232	52.32%
The number of hunters	0.2289	22.89%
Orographic conditions	0.1553	15.53%
The openess of the road network	0.0926	9.26%

Table 4 show that the number of direct beneficiaries (hunters and fishermen), then hunting area i.e. the length of water flow, has a significant influence on work of professional and guarding services and that when legislator i.e. political structures make decisions of organization these factors should be considered as determined criteria.

CONCLUSIONS

From these results we can conclude that integrated management of fishing and hunting areas would improve management functions, reduce costs and increase business efficiency. That would certainly have a positive influence on the social aspect and it would change public awareness that fishing and hunting are not only social but also significant economic category. By integrated management of fishing and hunting areas the monitoring would be facilitated with clearer and more comparable results, and the control and usage of funding would be incomparably better and more rational. In terms of functioning of professional and guarding services it is necessary to perform a detailed analysis of geographical distribution, size and number of hunting i.e. fishing areas, with the aim of optimizing its management in the economic and ecological principles.

The potential benefit for the state can be seen in reducing the cost of management, where regional centers at the levels of one or more areas could be established and which would be used for stuff training, organization of monitoring, reacting in accidental situations etc. Before all that, it is necessary to make legislation and afterward fishing and hunting areas, mutually compatible.

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