

# Sports Development in the Commonwealth of Independent States (CIS) with the use of Various Activities Effectiveness Measure

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## Abstract

The purpose of the study is to identify promising areas to improve the resource provision of sports in the regions of CIS. To achieve this goal, the following research methods were used: the analysis of special scientific and methodological literature, the study of directive documents and statistical materials (forms 1-FE, 3-AFE and 5-FE), the methods of observation, expert assessments and rating, the methods of sports development effectiveness evaluating, the methods of strategic planning (SWOT analysis) and the DEA method, the methods of mathematical and statistical processing of results. The study gives the concepts of sports activities effectiveness measure, the effectivity of sports activities, the effectiveness of physical education personnel, the sports facilities effective usage, the effectiveness of sports financing. We have determined the relationship between the characteristics of the sports activities effectivity, the effectiveness of the implementation of human, material, technical and financial resources of the subjects of the CIS at different levels of sports development: sufficient (provides a social effect), promising (consolidates the results of positive development), requiring modernization (obliges to change significantly the development process). As the level of sports development increases, the composition of criteria and evaluation characteristics, their significance and the values of parameters, an increase in the number of reliable relationships between the analyzed indicators change. The structure of interrelations of qualitative indicators of sports development in the subjects of the CIS at different levels of development differs significantly, therefore, while choosing management decisions, it is necessary to take into account the level of sports development at which the subject of the federation is located. The optimal values of criteria and evaluation indicators of sports development in the subjects of the CIS for the period 2022-2023 have been determined. Personnel, material, technical and financial resources at the entrance to the sports development management system in the CIS are transformed into qualitative results of the development of mass sports, high-performance sports and adaptive sports, indicators of physical education of different population groups.

**Keywords:** Effective Development, Sport, Efficiency, Productivity, Interrelation of Indicators, Criteria and Evaluation Characteristics, Activity, Levels of Development.

## Methods and Research

The indicator of the sports activity productivity ( $y_1 = 2,86x_1 + 57,41x_2 + 103,53x_3 + 3167,0x_4 + 27417,1x_5$ ) characterized the number of trained athletes of mass categories ( $x_1$ ), first category ( $x_2$ ), Candidate Masters of sports ( $x_3$ ), Masters of Sports of

Russia ( $x_4$ ) and Masters of Sports of Russia International Class ( $x_5$ ) during the reporting year,  $n$  is the number of people engaged in sports. The effectiveness of sports activity is the value of the sports activity productivity per a person engaged in sports, the effectiveness of the physical education personnel activity is the indicator of the sports activity productivity per a physical

education worker, the efficiency of the sports facilities usage is the indicator of the sports activity productivity by the value of the one-time capacity of sports facilities, the effectiveness of sports financing is the value of investments in the development of sports by the indicator of the sports activity productivity. The study was conducted in the period of 2017-2023 in the subjects of the Russian Federation.

### Rationale

The effective development of sports in the country ensures the maximum achievement of the goal through the use of the most rational ways of sports activities organizing, the effective implementation of human, logistical and financial resources [1, 2]. Nowadays, each region of Russia must create independently and increase productively its own sports potential. In this context, in order to develop productive differentiated management decisions, it is important to know the specifics of the relationship between the performance indicators of various activities with the parameters of criteria and evaluation characteristics at different levels of sports development [3-5]. However, the inability to use the performance indicators of various activities in sports productively does not allow us to realize the real opportunities of each

region successfully, has a negative impact on the development of a strategy for the effective development of sports in the Russian Federation. The search for new ways to increase the resource potential of sports in the country determines the rationale of this study.

### Results and Discussion

Depending on the levels of sports development, the analyzed performance characteristics were divided into three levels: sufficient, promising and requiring modernization. At the sufficient level of sports development, first of all, the interrelations of the characteristics of the effectiveness of sports activities with the results of the European, World and Olympic Championships ( $r = 0,579$ ), indicators of the effectiveness of sports development ( $r = 0,578$ ) and the effectiveness of sports activities of specialized sports organizations ( $r = 0,542$ ) are highlighted (Table 1). At the promising level of sports development, the most significant correlation to the performance characteristics of the sports activities were identified with the results of the effectiveness of training athletes, rank 1 and IMR ( $r = 0,478$ ) and performance specialists sports associations ( $r = 0,433$ ).

**Table 1:** Interrelation of criterion-assessment indicators with the characteristics of the effectiveness of activities at different levels of sports development in the constituent entities of the Russian Federation.

No. p / p	Assessed indicators	Development levels			
		Indica- tors	Sufficient	Perspec- tive	Demanding moderniza- tion
1	2	3	4	5	6
The effectiveness of sports activities					
Preparation of sportsmen-rank-and-file and sports titles:					
1.	Mass sports categories	FS 1		411	574
	first rank, Candidate Master of Sports	FS2		478	
	Master of Sports of Russia	FS 3	364	424	
	Master of Sport International Class of Russia and Grandmaster of Russia	FS 4	447		
2.	The share of people who go in for sports in institutions of additional education	FS 5	433		
3.	Development of sports	FS6	578	427	464
4.	Educational level of coaches	FS 7	434		
5.	Results of European Championships, World Championships, Olympic Games	FS 8	579		
6.	The effectiveness of rated athlete training in the adaptive physical education	FS 9		410	
7.	The effectiveness of the specialized sports organizations activities	FS 10	542	433	471
8.	The share of people engaged in sports sections	FS 11			433
9.	The number of members of Russian national teams per 100 thousand of people engaged in sports	FS 12	434		
The effectiveness of physical education and health activities					
1.	The share of people engaged in sports	FD 1	547	415	386
2.	The state of health of people involved	FO 2	611	444	
3.	The share of pupils and students of the special medical group	DO 3		-428	
4.	The share of pupils and students of the special medical group attending classes	DO 4			473
1.	2	3	4	5	6

5.	Efficiency of work on the GTO complex (Ready for Labor and Defense)	DO 5		415	
6.	Share of those involved in Adapted Physical Education (APE)	DO 6	329		
7.	The share of those engaged in enterprises, institutions and organizations	DO 7			345
8.	Percentage of those engaged in sports at the place of residence	FD 8	417		
9.	The proportion of people engaged in sports facilities	DO 9		328	
10.	The share of those engaged in educational institutions	FD 10	534		433
The effectiveness of the physical education personnel activity					
1.	The number of physical education personnel per 10 thousand inhabitants	FC 1			467
2.	The number of people engaged in sports per one physical education worker	FC 2	- 477	- 415	
3.	The number of students in general education institutions per one physical education teacher	FC 3			- 401
4.	The number of students in universities per teacher	FC 4		- 394	- 361
5.	The number of students in preschool institutions per one methodologist	FC 5	-431		
6.	Share of coaches at the further education institutions	FC 6		520	
7.	The share of sports personnel in educational institutions	FC 7	370		
8.	The share of physical education personnel at enterprises and organizations	FC 8		465	
9.	The level of education of physical education personnel	FC 9	562		
Efficiency of sports facilities usage					
1.	The value of the ENP of sports facilities per 10 thousand inhabitants	MT 1	360		
2.	The value of the FNC of sports facilities per 1,000 people involved	MT 2	572	529	454
3.	The amount of provision with sports halls per 1 million inhabitants	MT 3		420	362
4.	The amount of provision with stadiums per 1 million inhabitants	MT 4		376	
5.	The value of the provision of plate sports facilities per 1 million inhabitants	MT 5	461		398
6.	The amount of provision with swimming pools per 1 million inhabitants	MT 6		533	
7.	Comprehensive assessment of the provision of sports facilities	MT 7	563		
8.	The workload of sports facilities	MT 8	524		
9.	The size of the area of sports facilities per 100 people involved	MT 9		350	
Effectiveness of sports financing					
1.	The amount of funding per inhabitant	F 1		415	339
2.	The amount of funding per student	F 2	447		
3.	The amount of funding per one physical education worker	F 3	396	514	
4.	The share of extrabudgetary funding sources	F 4		390	392
5.	Salary of physical education workers	F 5	367		
6.	Expenses for sporting events	F 6		385	

Note. Correlation coefficients are multiplied by 1000, reliable indicators at a one-percent significance level are highlighted.

At the level of sports development that requires modernization, the interrelations of the characteristics of the effectiveness of sports activities with the indicators of the effectiveness of training athletes of mass categories ( $r = 0,574$ ) and the effectiveness of specialized sports organizations ( $r = 0,471$ ) are highlighted. Thus, as the indicators of sports development increase, there is an increase in the number of reliable relationships between them [6-9].

At a sufficient level of sports development, the interrelations of the characteristics of the effectiveness of physical education and recreation activities with health indicators ( $r = 0,611$ ), the percentage of people engaged in sports in the region ( $r = 0,547$ ) are highlighted. At the perspective level of sports development, first of all, the interrelations of the characteristics of the effectiveness of physical education and recreation activities with the percentage of those engaged in educational institutions ( $r = 0,472$ ) and

health indicators ( $r = 0,444$ ), the percentage of those engaged in sports in the region ( $r = 0,415$ ) are determined.

At the sufficient level of development of sports, the efficiency of sports facilities usage, the importance of the indicators of the value of the ENP of sports facilities per 1 thousand students ( $r = 0,572$ ), the comprehensive assessment of the relative provision of the population with sports facilities ( $r = 0,563$ ), the workload of sports facilities ( $r = 0,524$ ) are high. At the perspective level of sports development, it is important to provide the population with swimming pools ( $r = 0,533$ ), the number of ENP sports facilities per 1 thousand students ( $r = 0,529$ ), the provision of the population with sports halls ( $r = 0,420$ ). At the level of sports development requiring modernization, the values of the ENP of sports facilities per 1 thousand students ( $r = 0,454$ ), the availability of planar sports facilities ( $r = 0,398$ ) and sports halls ( $r = 0,362$ ) are important. As the levels of sports development increase, the number of reliable relationships with the characteristics of the effectiveness of the use of sports facilities increases.

At the sufficient level of sports development, the amount of investment per student ( $r = 0,447$ ) in the effectiveness of sports financing is dominated, at the promising level of development the amount of financing per sports worker ( $r = 0,514$ ) is dominated, at the level of development requiring modernization the amount of sports financing per resident ( $r = 0,319$ ) is dominated.

As the level of sports development increases, the composition of criteria and evaluation characteristics, the significance and values of parameters change, the number of reliable relationships between the analyzed indicators increases: the level of development requiring modernization is 16 relationships; the prospective level of development is 24 relationships, the sufficient level of development is 25 relationships. This distribution of relationships indicates the monolithic structure of the indicators of sports development at the sufficient level and the possibility of influencing them in order to increase the level of development. The indicators of criteria and evaluation characteristics included in one group of indicators had high reliable relationships with each other and weak relationships with variables of the other groups.

We have analyzed the structure of the interrelation of indicators of sports development at the regional level (the promising level of development characteristic of most regions). The stem part of the dendrogram (indicators linking all the results into the system) is represented by the following characteristics: the effectiveness of the physical education personnel activity; financing of the indicators of the ENP of sports facilities; the effectiveness of the sports facilities usage; evaluation of the ENP of sports facilities; the number of students per physical education worker; the number of athletes who have fulfilled the next qualification and discharge standards; the number of trained athletes of the first, the second and third sports categories and Candidate Master of Sports per physical education worker; sports financing per resident; the effectiveness of sports financing. Such important characteristics as the effectiveness of sports and fitness activities, the relative number of sports facilities, the number of population per physical education worker, indicators of sports financing per student did not appear in the stem part of the dendrogram, as they were not taken into account in the practical activities of

sports organizations and were absent in statistical state reporting forms (1-PE, 3-APE, 5-PE).

The other indicators were distributed into nine branches: one of them is combined, eight of them are monocomponent ones. The indicators of the ENP of sports facilities per 1 thousand people engaged in sports are presented separately. The relationship between the effectiveness of sports and fitness activities at the regional level has not been revealed.

The structure of interrelations of qualitative indicators of sports development in the subjects of the Russian Federation with a promising level of development differs significantly from the structure of indicators of the regions with the sufficient level of sports development and the level requiring modernization. When choosing management decisions, it is necessary to take into account the level of development of sports at which the subject of the federation is located.

The development of criteria-evaluation characteristics of sports development until 2023 for the sufficient level of development was carried out on the basis of regression equations of the type:  $y = ax + b$ , where  $y$  is the indicator of the sufficient level of sports development,  $x$  is the value of criteria-evaluation characteristics,  $a$  and  $b$  are coefficients. The rational values of criteria and evaluation indicators of sports development in the Russian Federation are determined: the number of physical education workers per 10 thousand inhabitants is equal to 29.5-30.4 people; the number of students per physical education worker is 148.6-152.7 people.; the number of ENP of sports facilities per 1 thousand students is 131.0-134.0 people; the number of trained athletes of mass categories per physical education worker is equal to 6.6-6.7 people, the first category and CMS per 100 physical education workers – 55.6-56.5 people, Masters of sports of Russia per 1 thousand physical education workers – 19.5-20.0 people, Masters of sports of Russia of international class per 1 thousand physical education workers – 2.3-2.4 people; financing of sports per inhabitant is equal to 4.2-4.4 thousand rubles; financing of the indicator "equivalent of sportsmanship" is 4.0-4.2 thousand rubles. Focusing on these parameters of criteria and evaluation characteristics will allow us to achieve quickly the sufficient level of sports development in the subjects of the Russian Federation, optimize financial costs, increase the productivity of the process being studied and the effectiveness of Russian athletes at major international competitions.

Personnel, material, technical and financial resources at the entrance to the sports development management system in the Russian Federation are transformed into qualitative results of the development of mass sports, high-performance sports and adaptive sports, indicators of physical education of different population groups [10].

The results of the conducted scientific research are being used in the development of the sports structures of Ashgabat, the city declared as the new sports hub of the Commonwealth of Independent States, and Turkmenistan's sports systems based on scientific principles [11].

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