

## THE ADVANTAGE OF THE “ $\chi^2$ – CRITERION” METHOD IN STUDYING THE FACTORS RELATED TO RAISING PERSONAL ECOLOGICAL LEGAL AWARENESS IN THE ECOTOURISM SYSTEM

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**Resume:** In this article, the measures taken today in the ecotourism system to raise the environmental legal consciousness of the individual, as well as the development of methods for determining the effectiveness of practical work and the advantages of using the “ $\chi^2$  – criterion” model, aimed at showing the correlation between existing problems, are highlighted.

**Key words:** ecological environment, ecotourism, environmental legal consciousness, “ $\chi^2$  – criterion” method.

The ecological situation that has arisen in the world, especially in our country, requires further increase of the rights and obligations of individuals in the field of using nature and protecting the natural environment. Today, it is becoming more and more important to create a methodology for measuring the effectiveness of the measures, plans and practical work carried out in order to protect the pure ecological environment, to find criteria that determine the place of ecology in human life, to form environmental legal consciousness in a person, and to use models aimed at showing the correlation between existing problems. Because if we don't understand that ecology is the “core” of the modern world we live in, if we don't have the skills to use models that evaluate the effectiveness of the work done in order to find the integration of man and pure ecological environment, the level of effectiveness of what we do and achieve will remain unnoticed.

In this regard, the head of our state, Shavkat Mirziyoyev, said, “The most important issue is that we must seriously focus on increasing the ecological culture of the population. Of course, such problems cannot be solved only by administrative means, it can be achieved by cultivating love for mother nature in the hearts of the young generation, and a sense of belonging to it”<sup>1</sup>. Because today, even in the development of ecotourism, increasing the sense of involvement of everyone remains one of the most important tasks before us. First of all, this is directly related to raising the environmental consciousness and culture of each person.

The “ $\chi^2$  – criterion” method used in this study was developed by Carl Pearson in 1900 and is also called Pearson's satisfaction criterion. Pearson presented a theory to reveal the relationship between model predictions and experimental data. It is useful in examining issues

<sup>1</sup> Мирзиёев Ш.М. Янги Ўзбекистон стратегияси. – Тошкент: “O’zbekiston” нашриёти, 2021. –Б. 392.

related to the estimation of unknown model parameters and the agreement between the model and experimental data.

Sometimes in the process of processing received data, we come across complex tables that contain several sub-tables. Analyzing such tables presents several difficulties. Naturally, in such a situation, effective results can be achieved if the table is analyzed by dividing it into part tables, and then a conclusion is drawn by summarizing the results.

$\chi^2$  using the criterion, we can determine the frequency of survey results obtained in each option. We call this frequency coefficient.  $\chi^2$  It should be noted that in the given criterion,  $\chi^2$  it is not necessary to take it as the square of some value, but as a definition based on the name of the criterion<sup>2</sup>.

The “ $\chi^2$  – criterion” method in studying the need to raise the environmental legal consciousness of a person, the results of a sociological survey conducted in Khorezm, Kashkadarya, Jizzakh, Namangan, Samarkand regions <sup>3</sup>were analyzed in the form of a table, and the obtained results were tabulated.

When we analyze the data received from respondents by class,  $\chi^2$  the coefficient of individual criteria for multi-criteria questionnaires is determined by the following formula:

$$\chi^2 = \sum_{i=1}^m \frac{(E_i - T_i)^2}{T_i}$$

This where :

$E_i$  –factor value;

$i$  –empirical value by factor;

$T_i$  – theoretical value.

It is known that it is empirical value in the table original value with will be the same . Theoretical value while according to the following formula defined as :

$$T_i = \frac{\sum_{j=1}^n x_{ij} \cdot \sum_{k=1}^m x_{kj}}{\sum_{j=1}^n \sum_{k=1}^m x_{kj}}$$

This where :

$m$  –number of factors;

$n$  – number of criteria;

$x_{ij}$  –and  $j$  –the ordinal number indicating the number of respondents in the factor according to the criterion.  $i$  –Summarizing this formula,  $\chi^2$  the formula for finding the coefficient of individual criteria <sup>4</sup>can be written as follows:

$$\chi^2 = \sum_{i=1}^m \frac{\left( E_i - \frac{\sum_{j=1}^n x_{ij} \cdot \sum_{k=1}^m x_{kj}}{\sum_{j=1}^n \sum_{k=1}^m x_{kj}} \right)^2}{\frac{\sum_{j=1}^n x_{ij} \cdot \sum_{k=1}^m x_{kj}}{\sum_{j=1}^n \sum_{k=1}^m x_{kj}}}$$

<sup>2</sup>Язданов У.Т. Ўзбекистонда жамоатчилик фикрини ривожлантириш масалалари. –Т.: NISHON-NOSHIR, 2015. –Б.113-114

<sup>3</sup>This study was conducted in 2021 among 9th grade students of general secondary schools located in Khorezm, Kashkadarya, Jizzakh, Namangan, Samarkand regions .

<sup>4</sup>Язданов У.Т. Ўзбекистонда жамоатчилик фикрини ривожлантириш масалалари. –Т.: NISHON-NOSHIR, 2015. –Б.116



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Raised above passed from the formula used “What do you mean by ecotourism ?”\* on the subject conducted questionnaire the results analysis we do

this example  $m = 5$ ,  $n = 5$

$\chi^2$  6-shared number (Khorazm region) of respondents' opinion importance coefficient to determine process as follows will be :

$$E_1 = 10; E_2 = 13; E_3 = 16; E_4 = 9; E_5 = 16;$$

$$\sum_{j=1}^n \sum_{k=1}^m x_{kj} = (9 + 7 + 11 + 10 + 13 + 4 + 2 + 1 + 5 + 1 + 10 + 13 + 16 + 9 + 16 + 6 + 5 + 2 + 4 + 1 + 3 + 2) = 150$$

$$T_1 = \frac{\sum_{j=1}^n x_{1j} \cdot \sum_{k=1}^m x_{1j}}{\sum_{j=1}^n \sum_{k=1}^m x_{kj}} = (9 + 4 + 10 + 6 + 1) \cdot \frac{10 + 13 + 16 + 9 + 16}{150} = \frac{30 * 64}{150} = 12,8$$

$$\frac{(E_1 - T_1)^2}{T_1} = \frac{(10 - 12,8)^2}{12,8} = 0,6125$$

So, the coefficient of the answers given by the 9th grade students (respondents) of Urganch city, Khorezm region, general secondary school No. 6,  $\frac{(E_1 - T_1)^2}{T_1} = 0,61$  is equal to one question.

These respondents by the rest 4 questions gave the answers too seeing we go out Only in this of calculations last results cause will be passed. Because , our goal calculations show e mas, but to questions respondents by being given of answers importance coefficient to determine It is necessary when the first question to the analysis looking the rest too seeing exit can

$$\frac{(E_2 - T_2)^2}{T_2} = \frac{(9 - 8,4)^2}{8,4} = 0,04$$

$$\frac{(E_3 - T_3)^2}{T_3} = \frac{(6 - 9,6)^2}{9,6} = 1,35$$

$$\frac{(E_4 - T_4)^2}{T_4} = \frac{(4 - 7)^2}{7} = 1,28$$

$$\frac{(E_5 - T_5)^2}{T_5} = \frac{(4 - 5,8)^2}{5,8} = 0,55$$

Now, summarizing the individual coefficients mentioned above, the procedure for determining the total frequency, that is, the coefficient, for five questions asked by students of the 9th grade of general secondary education school No. 6  $\chi^2$  is calculated as follows:

$$\chi^2 \text{ 6-shared number} = \frac{(E_1 - T_1)^2}{T_1} + \frac{(E_2 - T_2)^2}{T_2} + \frac{(E_3 - T_3)^2}{T_3} + \frac{(E_4 - T_4)^2}{T_4} + \frac{(E_5 - T_5)^2}{T_5} = 3,84$$

that the total coefficient of answers **to five questions** by students of the 9th grade of secondary school No.6 located in the city of Urganch, Khorezm region is equal to 3.84.

\* This study was conducted in May 2021 at secondary school No. 6 in Urganch, Khorezm region.



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The above-mentioned statistical data were presented in the form of a table, from which the answers given by the students of the 9th grade of the 9th grade school of Urganch city of Khorezm region to 5 questions were analyzed by the “ $\chi^2$  – criterion” method and the coefficient of importance between their answers to the questionnaires was determined.

The results of the conducted research  $\chi^2 = \sum_{i=1}^m \frac{(E_i - T_i)^2}{T_i}$  were put into the “ $\chi^2$  – criterion” formula, and the obtained “numbers” were analyzed socio-philosophically, and the following conclusions were reached:

**First** of all, it is difficult to say that all types of mathematical modeling methods are without exception and highly effective and can be used in the analysis of social research results. But in today's fast-moving globalization, there is every reason to believe that the “ $\chi^2$  – criterion” method can be a methodological source for studying the causes of human problems.

**Secondly**, the advantage of this method over other mathematical methods is that, using it, it is possible to concretely or systematically analyze the factors that cause any problem.

**Thirdly**, the analysis of scientific research conclusions within the scope of social humanities using the “ $\chi^2$  – criterion” method does not create a balance between statistical and mathematical methods. On the contrary, it serves to ensure the harmony of interests aimed at discovering the purpose of research. In other words, through mathematical methods, it becomes possible to select safe information, which, in turn, is the “driving mechanism” of the practical work plan aimed at increasing the environmental legal awareness of a person.

**Fourth**, the “ $\chi^2$  – criterion” is the objective conditions that influence the functional integration of “social objects” aimed at changing social consciousness, helping to find “criteria, mechanisms and constructive foundations” that bring about the practical effectiveness of scientific theoretical ideas aimed at changing the consciousness of an individual. It is of scientific-theoretical and methodological importance as it helps to find the correlation relationship between the qualitative and quantitative indices of the system of determining subjective factors.

**Fifth**, creating a system aimed at acquiring knowledge and practical skills on the system of effective use of the “ $\chi^2$  – criterion” method - increases the practical importance of the educational system, which is a mass transformer of society, and forms its social-elite and private-corporate contours.

In general, revealing the purpose of the research through the “ $\chi^2$  – criterion” method serves to ensure the harmony of ecotourism interests, and this, in turn, is the “driving mechanism” of the practical work plan aimed at increasing the environmental legal consciousness of the individual.

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