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# Section 1. Economic

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## THE ECONOMETRIC ANALYSIS OF FINANCIAL INDICATORS OF COMMERCIAL BANKS ACTIVITIES

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**Abstract**

As the result of the econometric analysis of the financial instruments of a concrete joint-stock commercial bank, it was carried out the efficiency of transformation of bank activities in Uzbekistan.

**Keywords:** *bank, transformation, efficiency, financial indicators, net commission income, bank transaction costs, net profit*

### Introduction

Nowadays in Uzbekistan the process of Transformation of the economy on the basis of digitalization is considered as one of the most urgent issues that need to be implemented in Uzbekistan. In this field, commercial banks have achieved great technical and especially financial successes.

Therefore, in order to determine the level of efficiency of the activities of a concrete joint-stock commercial bank (the name of the bank has not been given in order to protect the trade secret) that successfully works in the field of digitization and transformation in our country we will conduct an econometric study of its financial indicators.

### Econometric analysis

In the econometric analysis of this bank, net interest income is Y as a result factor (billion soums), and the influencing factors are – net commission income – X 1 (billion soums), operational expenses of the bank – X 2 (billion soums) and net profit X 3 (billion soums) has been received.

We will conduct descriptive statistics based on the performance indicators of the bank for the quarters of 2018–2022 (Table 1).

**Table 1.** *Descriptive statistics*

| | Y | $X_1$ | $X_2$ | $X_3$ |
|---|---|---|---|---|
| Mean | 111.5050 | 54.55500 | 74.98000 | 33.31000 |

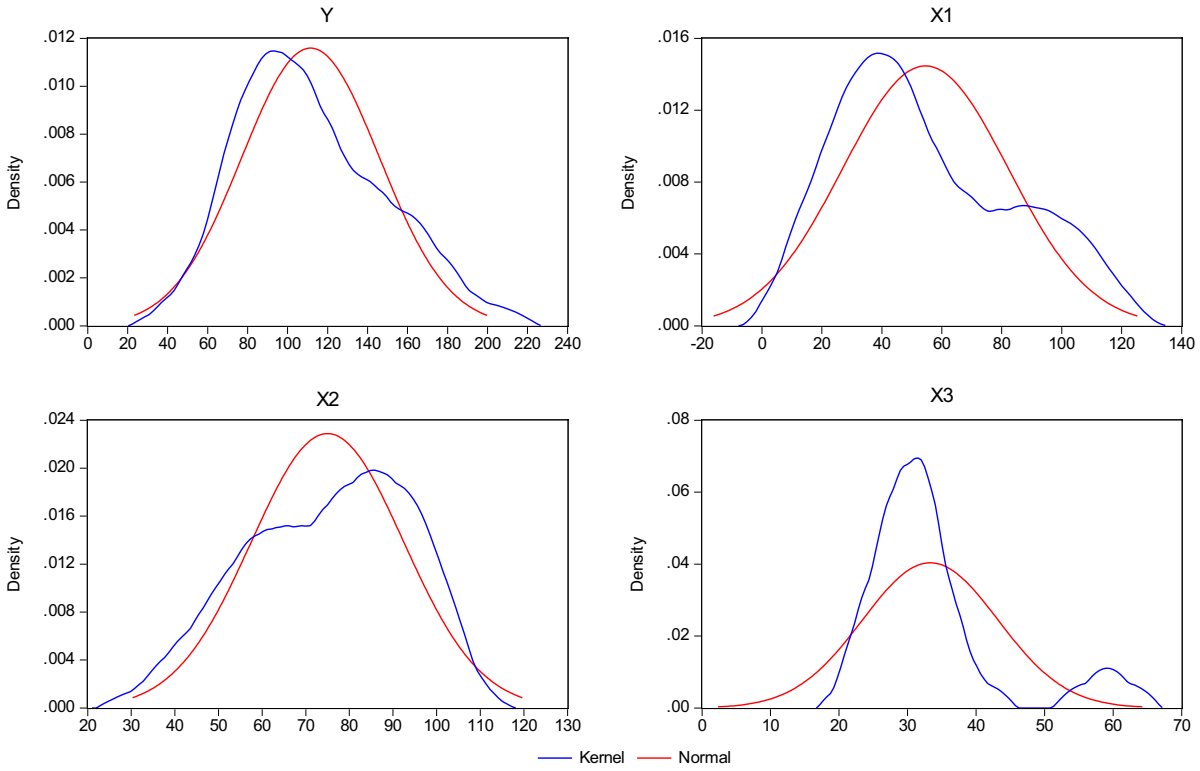
| | Y | $X_1$ | $X_2$ | $X_3$ |
|---|---|---|---|---|
| Median | 99.70000 | 46.35000 | 76.70000 | 30.75000 |
| Maximum | 189.5000 | 104.8000 | 99.10000 | 61.60000 |
| Minimum | 57.80000 | 22.40000 | 40.60000 | 22.30000 |
| Std. Dev. | 34.42180 | 27.58429 | 17.43377 | 9.887946 |
| Skewness | 0.606590 | 0.633415 | -0.379521 | 1.799375 |
| Kurtosis | 2.583561 | 1.997886 | 1.954918 | 5.649504 |
| Jarque-Bera | 1.371024 | 2.174241 | 1.390284 | 16.64240 |
| Probability | 0.503832 | 0.337186 | 0.499004 | 0.000243 |
| Sum | 2230.100 | 1091.100 | 1499.600 | 666.2000 |
| Sum Sq. Dev. | 22512.35 | 14456.97 | 5774.792 | 1857.658 |
| Observations | 20 | 20 | 20 | 20 |

The normal distribution function is determined by the following formula:

$$p(x) = \frac{1}{\sqrt{2\pi\sigma}} \cdot e^{\frac{-(x-a)^2}{2\sigma^2}}, \quad -\infty < x < \infty, \qquad (1)$$

As can be seen from Figure 1, all factors obey the law of normal distribution.

**Figure 1.** *Checking factors for normal distribution*




As can be seen from Figure 1, all factors obey to the law of normal distribution.

One factor has a negative skewness coefficient (lnX2), so the "tail" of this variable is skewed to the left, and also three factors have positive skewness coefficients (lnY, lnX1 and lnX3), the "tails" of these factors are skewed to the right.

In all factors, the value of the kurtosis coefficients is less than 3, except for the factor lnX3, and therefore the top of the graph of the functions of these factors is lower than the theoretical graph, i.e. flat.

**Table 2.** *The Correlation matrix*

| Probability | Y | X1 | X2 | X3 |
|---|---|---|---|---|
| Y | 1.000000 | | | |
| X1 | 0.954628 | 1.000000 | | |
| | 13.60017 | ––- | | |
| | 0.0000 | ––- | | |
| X2 | –0.626636 | –0.625296 | 1.000000 | |
| | –3.411458 | –3.399473 | ––- | |
| | 0.0031 | 0.0032 | ––- | |
| X3 | 0.847719 | 0.278655 | –0.152048 | 1.000000 |
| | 10.20268 | 0.870362 | –0.652675 | ––- |
| | 0.0000 | 0.4211 | 0.5222 | ––- |

As can be seen from Figure – 2 that, visually there is a close direct relationship between the dependent variable and the factors influencing it.

We will calculate this relationship through the coefficients of private and paired correlation (Table 2).

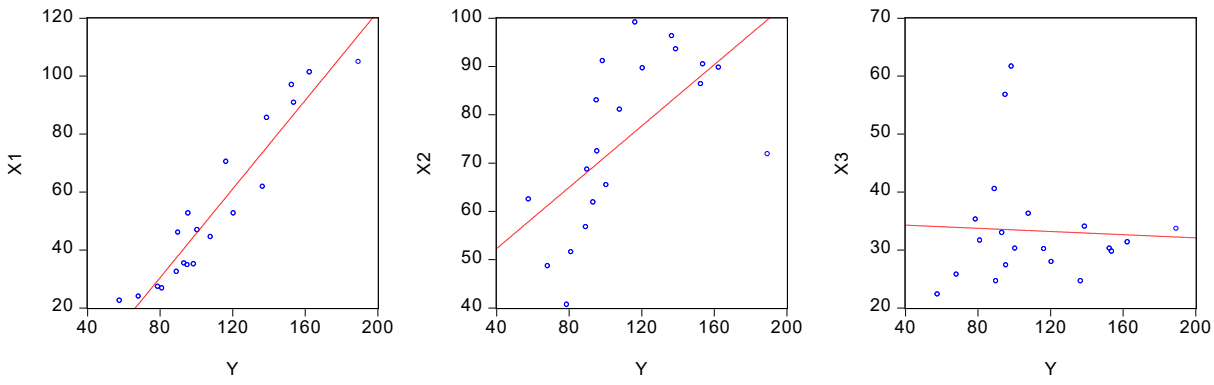
Two types of correlation coefficients are calculated here: partial and pairwise correlation coefficients.

Private correlation coefficients show the relationship of the dependent variable with each influencing factors. For example, the relationship between net interest income of the bank (lnY) and net fee income – (lnX1) the private correlation coefficient is 0.9546. This shows that there is a close relationship between these indicators. The correlation coefficient between the bank's net interest income (lnY) and the bank's operating expenses (lnX2) took a negative value and is equal to –0.6266. This shows that an increase in the bank's operating expenses leads to a decrease in the bank's net interest income. The correlation coefficient between bank's net interest income (lnY) and bank's net profit (lnX3) is 0.8477. There is a direct strong correlation between these indicators. (Table 2)

We check the multicollinearity in the connections between the influencing factors (Xi, Xj). Multicollinearity refers to the case where the pairwise correlation coefficient value is greater than 0.7 between two influencing factors. It can be seen from the indicators of Table 2 on the bank data that the connection densities between the influencing factors are not greater than 0.7. This indicates that there is no multicollinearity between the influencing factors and it is the basis for including all factors in the multifactor econometric model.

In order to verify the above, let's look at their dot graphs to determine the relationship of each factor with the resulting indicator (Figure 2).

**Figure 2.** *Relationship between the dependent variable and influencing factors*



To investigate autocorrelation in the series of residuals of the dependent variable, we calculate VIF (Variance Inflation Factors) coefficients (Table 3).

**Table 3.** *Results of calculation of VIF (Variance Inflation Factors) coefficients*

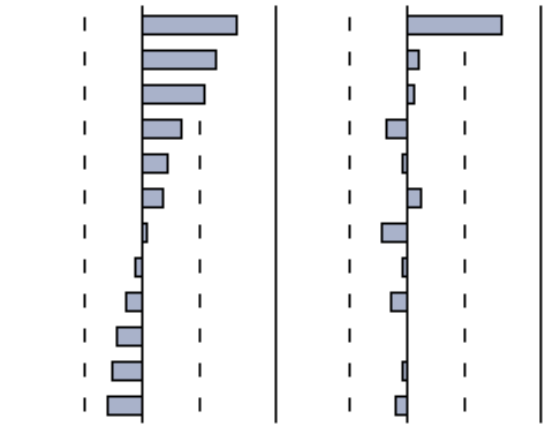
| Variable | Coefficient Variance | Uncentered VIF | Centered VIF |
|---|---|---|---|
| X1 | 0.013361 | 9.613669 | 1.878628 |
| X2 | 0.033147 | 38.11069 | 1.861707 |
| X3 | 0.064822 | 15.16167 | 1.171169 |
| C | 146.0899 | 28.41732 | NA |

According to the rule, the value of VIF coefficient of each factor should be less than 10. From the coefficients of the table we can see that the VIF coefficients of the factors are less than 10. This indicates the absence of autocorrelation in a number of residuals of the dependent variable.

Table 4 below presents the estimation of autocorrelation between factors and specific autocorrelation.

**Table 4.** *Determination of autocorrelation and private autocorrelation between factors*

Date: 01/28/23 Time: 15:05
Sample: 2018Q1 2022Q4
Included observations: 20



| Autocorrelation | Partial Correlation | | AC | PAC | Q-Stat | Prob |
|---|---|---|---|---|---|---|
| | | 1 | 0.735 | 0.735 | 12.507 | 0.000 |
| | | 2 | 0.578 | 0.083 | 20.682 | 0.000 |
| | | 3 | 0.477 | 0.058 | 26.571 | 0.000 |
| | | 4 | 0.309 | -0.171 | 29.197 | 0.000 |
| | | 5 | 0.189 | -0.044 | 30.243 | 0.000 |
| | | 6 | 0.165 | 0.114 | 31.095 | 0.000 |
| | | 7 | 0.031 | -0.196 | 31.129 | 0.000 |
| | | 8 | -0.054 | -0.047 | 31.235 | 0.000 |
| | | 9 | -0.136 | -0.135 | 31.972 | 0.000 |
| | | 10 | -0.201 | -0.005 | 33.753 | 0.000 |
| | | 11 | -0.245 | -0.036 | 36.683 | 0.000 |
| | | 12 | -0.273 | -0.083 | 40.793 | 0.000 |

The autocorrelation and private autocorrelation test between the factors also corresponded to the high obtained results.

It results that there is no autocorrelation in the studied time series, and it can be seen that all the residuals have probability values less than 0.05.

At the next stage, we will create a multi-factor econometric model of the bank's net interest income (Table 5).

**Table 5.** *Estimated parameters of the multifactor econometric model*

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| X1 | 1.225424 | 0.115589 | 10.601562 | 0.0000*** |
| X2 | –0.013803 | 0.182063 | –2.2765957 | 0.0015*** |
| X3 | 0.448323 | 0.254601 | 1.7608846 | 0.0974** |
| C | 30.75328 | 12.08676 | 2.5443774 | 0.0216*** |
| R-squared | 0.926925 | Mean dependent var | | 111.5050 |
| Adjusted R-squared | 0.913224 | S.D. dependent var | | 34.42180 |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| S.E. of regression | 10.13990 | Akaike info criterion | | 7.647689 |
| Sum squared resid | 1645.080 | Schwarz criterion | | 7.846835 |
| Log likelihood | –72.47689 | Hannan-Quinn criter. | | 7.686564 |
| F-statistic | 67.65149 | Durbin-Watson stat | | 1.777335 |
| Prob (F-statistic) | 0.000000 | | | |

*Note: *** – 0.05 accuracy, ** – 0.1 accuracy*

Using the data of Table 5 above, the multifactor econometric model of banking activity shows:

$$\ln \hat{y} = 30{,}7533 + 1{,}2254x_1 - \\ -0{,}0138x_2 + 0{,}4483x_3 . \quad (4)$$

The calculated multifactor econometric model (4) shows that the bank 's net commission income averages 1 bln. If it increases to com ($X_1$), the net interest income of the bank (*Y)* average 1.2254 billion. as it may increase to soums. Bank 's operating costs ($X_2$) average 1.0 bln. increase in soum, net interest income of the bank (*Y)* an average of 0.0138 billion. and the net profit ($X_3$) is on average 1.0 bln. An increase in soums will increase the interest income of the bank (*Y)* average 0.4483 billion. it is observed that it will increase to soum.

To check the quality of the multifactor econometric model (4), we examine the coefficient of determination. The coefficient of determination shows how many percent of the resulting factor is made up of the factors included in the model. The calculated coefficient of determination ($R^2$ – R-squared) is equal to 0.9269. This shows that 92.69 percent (4) of the bank's net interest income (*Y)* is made up of the factors included in the multi-factor econometric model. The remaining 7.31 percent (1.0–0.9269) is the influence of unaccounted factors.

In order to be able to compare models with different number of factors and this number of factors does not affect the $R^2$ statistic, a smoothed coefficient of determination is usually used, i.e.:

$$R^2_{\text{adj.}} = 1 - \frac{s^2}{s^2_y} \quad (5)$$

Adjusted coefficient of determination (Adjusted R-squared) is equal to 0.9132 and its closeness to $R^2$ means that the model can accept values around the change in the number of influencing factors.

We check the statistical significance of the multifactor econometric model (4) using Fisher's F-criterion. Fisher's calculated F-criterion value is compared with its value in the table. If $F_{count} > F_{table,}$ then the multivariate econometric model (4) is said to be statistically significant.

Given the level of significance $\alpha = 0{,}05$ and the degrees of freedom $k_1 = 3$ and, $k_2 = 20 - 3 - 1 = 16$ the table value of the F-criterion $F_{count} = 3.24$ is equal to. The calculated value of the F-criterion is $F_{count}$ = 67.6515 and the table value is equal to $F_{table}$ = =3.24 and the multifactor econometric model (4) is called statistically significant because the condition of $F_{count} > F$ table is fulfilled.

We check the reliability of calculated parameters of the multifactor econometric model (4) using Student's t-creation. The table value of t-criterion is equal to confidence probability and degree of freedom.

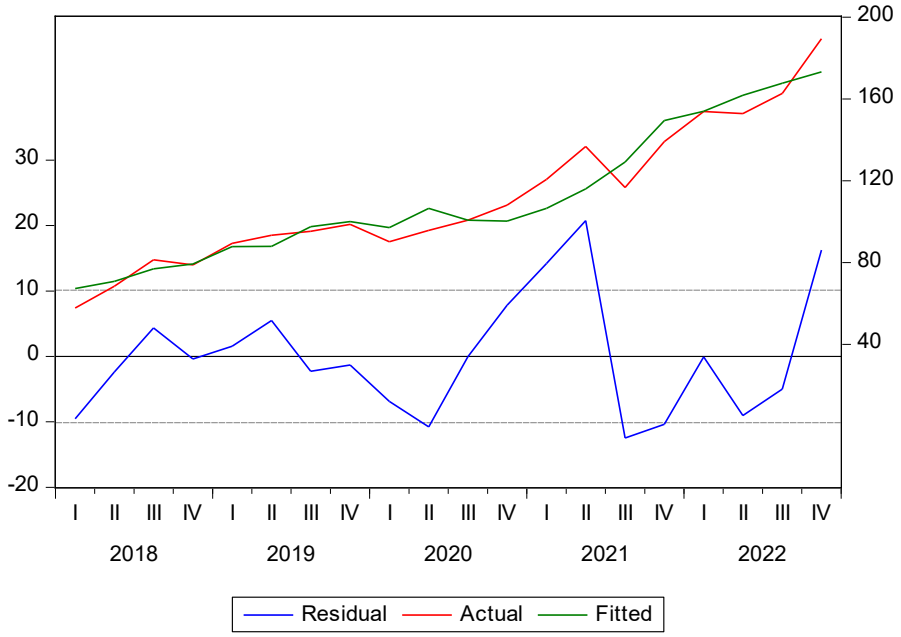
From the regression calculations, it can be seen that the calculated values of the t-criterion for all factors are greater than the table value in accuracy (Table 5). This allows these factors to participate in the multifactor econometric model. The resulting factor according to the multivariate econometric model (4). We use the Darbin-Watson (DW) criterion to check autocorrelation in the residuals.

The calculated Darbin-Watson value is compared with the DWL and DWU in the table. If DWcount < DWL, the residuals are said to have autocorrelation.

If DWcount > greater than DWU, the residuals are said to have no autocorrelation. The lower limit value of the Darbin-Watson criterion is DWL = 1.00 and the upper limit value is DWU = 1.68. DW = 1.7773. Therefore, since DWAccount>DWU, there is no autocorrelation in the net interest income (Y) balances of the resulting factor bank.

The absence of autocorrelation in the residuals of the resulting factor also shows that the multi-factor econometric model given above (4) can be used in forecasting (Figure. 3).

**Figure 3.** *Graph of the actual (Actual), calculated (Fitted) values of the bank's net interest income and the differences between them (Residual)*

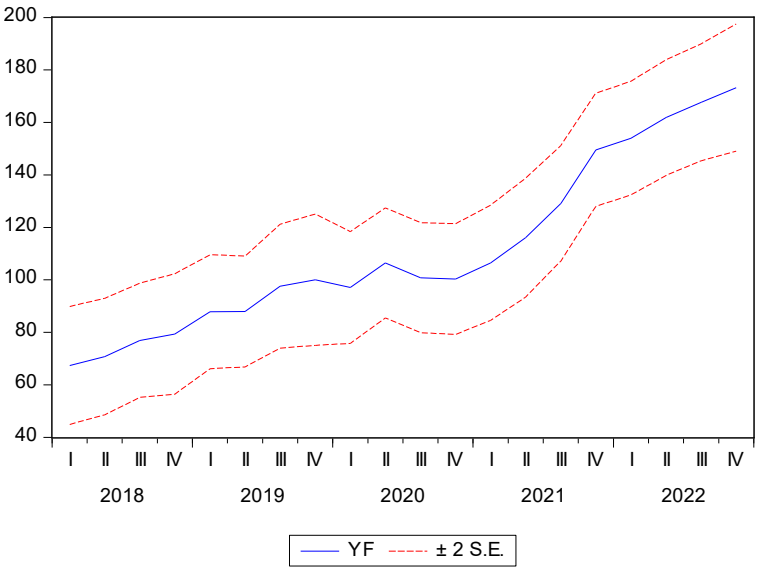



It can be seen from Figure 3 that (4) the graph of the calculated values of the bank's net interest income according to the multifactor econometric model is very close to the graph of its actual values, and the differences between them are not so great. This is another proof that the multifactor econometric model (4) can be used in forecasting the bank's net interest income for near future.

From the multifactor econometric model calculated (4), we calculate the value of the MARE coefficient in forecasting the output indicator for future periods.

If the calculated MARE coefficient value is less than 15.0 percent, the model can be used to predict the resulting factor, otherwise it cannot be used. The value of the MARE coefficient on the bank's net interest income is 8.3294 percent (Figure 4).

**Figure 4.** *Indicators of using the estimated multifactor econometric model in forecasting*




| | |
|---|---|
| Forecast: YF | |
| Actual: Y | |
| Forecast sample: 2018Q1 2022Q4 | |
| Included observations: 20 | |
| Root Mean Squared Error | 9.069398 |
| Mean Absolute Error | 7.046402 |
| Mean Abs. Percent Error | 6.299383 |
| Theil Inequality Coefficient | 0.039003 |
| Bias Proportion | 0.000000 |
| Variance Proportion | 0.018968 |
| Covariance Proportion | 0.981032 |

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# Section 2. Engineering science in general

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## STUDY OF THE ADSORPTION PROCESS OF HEAVY METAL IONS BY MODIFIED RICE HUSK

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**Abstract**

Adsorption of heavy metal ions is an important aspect for purifying water from pollutants and ensuring environmental safety. In this study, the adsorption process of heavy metal ions was studied using modified rice husk as an adsorbent. Experimental studies included determining optimal conditions for maximum removal of metals from aqueous solutions, including varying parameters such as contact time and pH of the medium, as well as studying changes in the structure of the surface layer of the resulting adsorbent. The results showed the effectiveness of modified rice husk in the adsorption process of heavy metal ions, highlighting its potential as a promising material for wastewater treatment.

**Keywords:** *adsorption, heavy metal ions, rice husk, monoethanolamine, wastewater, pH, kinetics.*

### Introduction

In recent years, the problem of rational use of water resources necessary to support various aspects of human life has become increasingly urgent. For the countries of Central Asia, located in an arid zone with low humidity, this problem is not limited only to a shortage of water resources, but is also associated with a deterioration in their quality. Along with the lack of drinking water, pollution of surface and groundwater by wastewater from industrial enterprises becomes an important aspect.

According to many studies conducted to monitor the condition of the Chirchik and Akhangaran rivers, which are the main sources of industrial and municipal drinking water supply for a significant part of the population, it was revealed that the water quality parameters in them do not meet the established standards in terms of biochemical oxygen demand (BOD), chemical oxygen con-

sumption (COD), nitrogen content and heavy metals exceeding the maximum permissible concentrations (Usmanov et al., 2019).

Among the main sources of river pollution are discharges of insufficiently treated industrial wastewater from enterprises involved in the production of mineral fertilizers, such as JSC "Maksam-Chirchik" and the Almalyk Mining and Metallurgical Combine.

The wastewater from these enterprises contains particularly dangerous heavy metal ions, such as copper, zinc, nickel, and lead, which have toxic, carcinogenic and mutagenic properties. They can accumulate in the body, causing serious illness. Therefore, the problem of cleaning industrial and domestic wastewater, as well as preparing water for technical and municipal drinking needs, is becoming more and more important every year.

The most common methods for treating wastewater from heavy metal ions are reagent methods, which consist in converting them into insoluble metal hydroxides and their precipitation in the form of sludge. However, with the increase in the volume of wastewater generated and the tightening of sanitary requirements for the quality of treated water, these methods currently do not provide the required degree of water purification. This leads to pollutants entering natural water bodies and, as a result, entering the human body through the food chain.

Another significant problem is the use of outdated treatment plants in many plants. These installations require upgrades to improve efficiency, which entails significant costs. Ensuring compliance with hygiene standards under such conditions becomes extremely challenging. In such situations, the most reasonable solution is to use wastewater tertiary treatment methods after the reagent treatment process. One of the effective post-treatment methods is the adsorption method.

Bioadsorbents are increasingly used in wastewater treatment practice, they have significant efficiency and a number of advantages over synthetic sorbents, such as high adsorption capacity, environmental safety, availability, low cost, the possibility of reuse and regeneration, as well as a wide range of applications (Kyzas, Kostoglou, 2014).

The main objective of this study was to obtain rice husk based adsorbent through chemical modification using monoethanolamine for purification of wastewater from heavy metal ions generated at the JSC "Maksam-Chirchik" during the production of mineral fertilizers.

Rice husk has attracted the attention of researchers due to its availability and low cost. It is insoluble in water, has high mechanical strength and chemical stability. Its feed value is low, and transportation costs are significant, especially when used at a considerable distance from the place of formation.

Rice husk consists of lignin (21%), cellulose (42%), hemicellulose (21%), and the inorganic part consists of silica (20%) (Sud et al., 2008).

## Research methods

The process of binding metal ions is due to the presence of hydroxyl groups in the structure of the adsorbent. To increase the adsorption capacity of rice husks, treatment with alkaline reagents is most often used.

In this study, the adsorbent was obtained by chemical modification of rice husk using an aqueous solution of amino alcohol (monoethanolamine) at a certain component ratio: 1 g of rice husk per 100 ml of modifier solution. The treatment process was carried out for 24 hours at room temperature. The solution was then filtered, and the rice husks were washed with water and dried.

The resulting adsorbent was used to purify wastewater from copper ions Cu (II) and nickel Ni (II). To analyze the adsorption capacity, 100 ml of a wastewater solution of a given concentration and 1 g of adsorbent were added to 250 ml flasks. The flasks were kept for 60 minutes with constant shaking. Then the solutions were filtered, and the content of metal ions in water was determined using the atomic absorption method using an Agilent spectrometer Technologies 140 Series AA (France).

## Effect of pH on adsorption

The impact of pH on adsorption was investigated using a PXSJ-216 F pH-meter (manufactured in China). For the experiment, 100 ml of a solution containing Cu(II) and Ni(II)ions at a concentration of 50 mg ×

× l–1, along with 1 g of the adsorbent sample, were placed in 200 ml flasks. The pH of the water in each flask was adjusted within the range of 2 to 8 using 0.1N HCl and NaOH solutions. The flasks' contents were then agitated on a PS-1 BioSan shaker at 150 rpm for 60 minutes at a temperature of 20 °C. Subsequently, the water was filtered, and the metal content was determined using flame atomic absorption spectrophotometry.

**Characteristics of surface morphology**

Studying the surface of rice husks allows one to analyze changes in the surface structure after treatment, assess the possibility of the formation of a porous structure, and also evaluate the structural features of adsorbed molecules. A high-magnification microscope allows one to visualize the "fixation" of molecules of adsorbed substances on the surface of rice husk grains. To analyze the surface structures of rice husk grains, a ZEISS EVO LS15 SEM microscope (Germany) was used in this study.

**Effect of contact time on adsorption**

The study of the influence of the contact time of the test solution on adsorption was carried out in flasks with a volume of 250 ml containing 100 ml of waste water of a given concentration and 1 g of adsorbent. The contents of the flask were continuously stirred on a shaker at a temperature of 20 °C for a certain time. The contact time ranged from 2 minutes to 2 hours. At certain intervals, water samples were filtered and the metal content in water was determined by the atomic absorption method.

The kinetic data on the sorption of metal ions were analyzed in accordance with the pseudo-first and pseudo-second order kinetic equations.

Pseudo-first-order kinetic equation (Lagergren's equation) has the form of (Thajeel, 2013):

$$\frac{dq_t}{dt} = K_1\left(q_e - q_t\right), \qquad (1)$$

where $q_t$ and $q_e$ — the amount of metal ions adsorbed at a given time and in a state of equilibrium (mg × $g^{-1}$); $K_1$ is the rate constant of the sorption process of the first order ($min^{-1}$).

Ho and McKay's model (Ho & Mckay, 1999) describes the kinetic patterns of adsorption in terms of pseudo-second order rates (Ho & Mckay, 1999; Ho & McKay, 2002; Thajeel, 2013).

$$v = \frac{dq_e}{d\tau} = k_2\left(q_{e\infty} - q_{e\tau}\right)^2, \qquad (2)$$

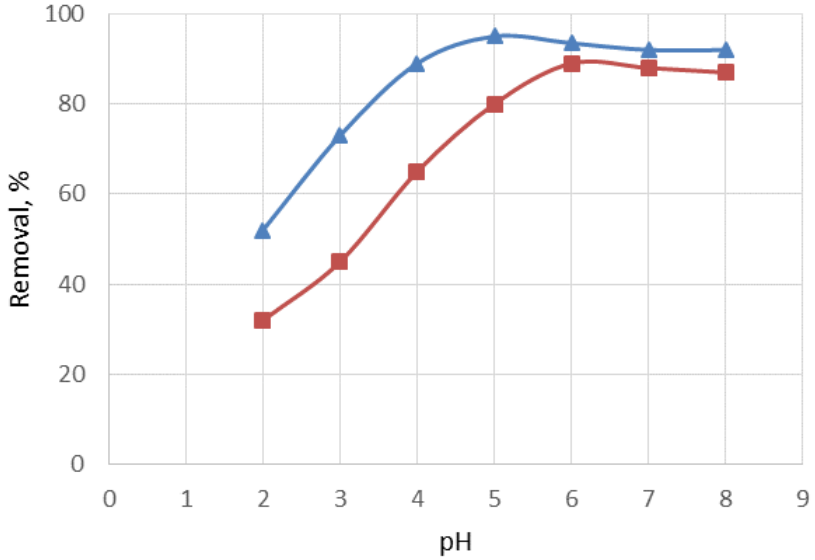
where $k_2$ is the pseudo second order rate constant (g × $mg^{-1}$ × $min^{-1}$, g × $mg^{-1}$ × $h^{-1}$).

**Results**

***Effect of pH on the adsorption***

As noted in the literature (Witek-Krowiak et al., 2011), the pH of the solution plays a significant role in the adsorption process. To assess the effect of solution pH on the adsorption of metal ions, studies were carried out in the range of values from 2 to 8.

**Figure 1.** *Dependence of adsorption on pH for ions ▲ — $Cu^{2+}$ and ions ■ — $Ni^{2+}$*

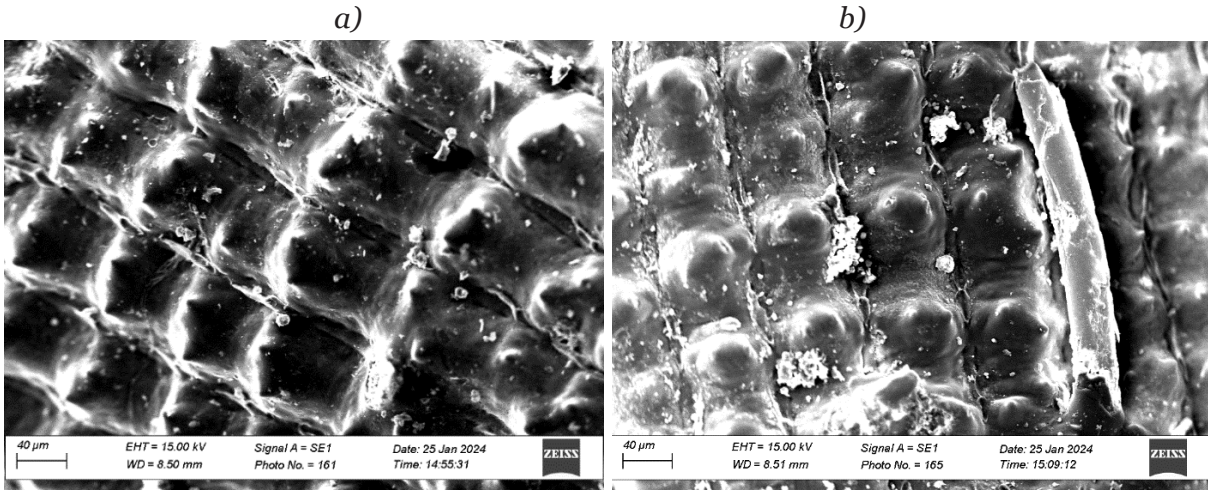


With an increase in the pH of the solution, an increase in the degree of purification of wastewater from copper ions is observed from 52% at pH = 2 to 95% at pH = 5, and for nickel ions — from 32% to 89%, respectively. Further, adsorption remains practically unchanged at pH values of 6 and higher. Changes in pH affect the surface charge of the adsorbent and the degree of ionization of metal compounds in solution. At low pH values, $H^+$ ions, which have high mobility, predominate, which leads to the formation of a positively charged adsorbent surface and a decrease in the adsorption of metal cations. With increasing pH, the concentration of $H^{+\ ions}$ in the solution decreases, which leads to the formation of a negatively charged adsorbent surface and an increase in the adsorption of metal cations due to an increase in electrostatic attraction. Based on this, all subsequent experiments were carried out at optimal values of pH = 5 for copper ions and pH = 6 for nickel ions.

### *Characteristics of surface morphology*

Scanning electron micrographs of untreated rice husk and modified rice husk are shown in Figure 2.

**Fig 2.** *Scanning electron micrographs of: a) unprocessed rice husk and b) modified rice husk*




At low magnification of the electron microscope, some cone-shaped and raised contours can be observed on the surface of the untreated rice husk in Figure 2(a). The morphological structure of the surface of the modified rice husk is shown in Figure 2(b). Numerous “dot spots” are observed on the cell wall, which may indicate a violation of the integrity of the surface structure of the adsorbent, which helps to increase the adsorption of metal ions by increasing the number of active binding sites.

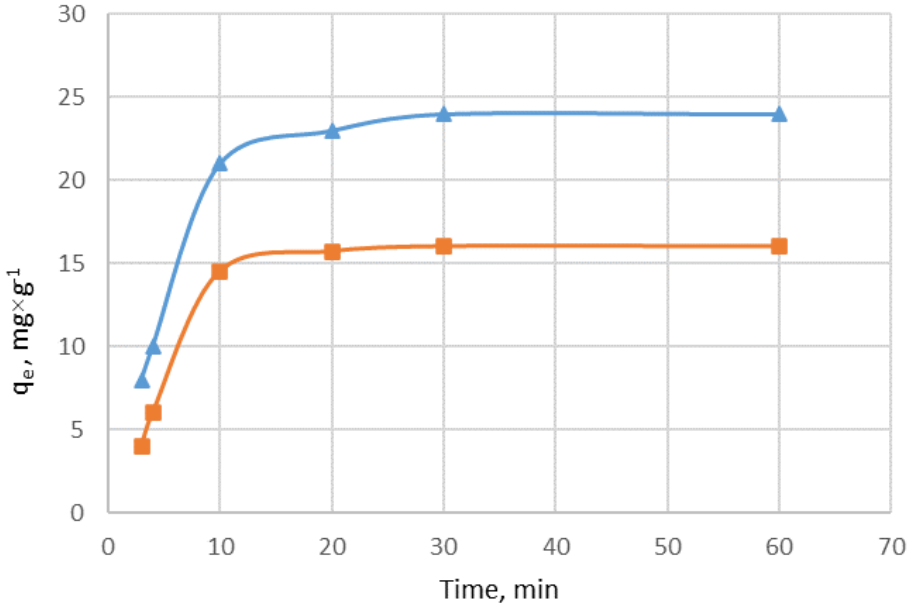
Apparently, the fats, proteins and soluble polysaccharides in the rice husk were dissolved after treatment with monoethanolamine, resulting in an improvement in the physicochemical properties of the rice husk and an increase in its adsorption capacity.

### Effect of contact time on adsorption

The influence of the contact time at different initial concentrations of solutions was studied. The dependence of adsorption on time is shown in Fig. 3.

Figure 3 shows that during the first 10 minutes there was a rapid increase in adsorption, which amounted to 21 mg × $g^{-1}$ for copper ions and 14.5 mg × $g^{-1}$ for nickel ions, then there is a slowdown in the adsorption rate up to 30 minutes, and then the adsorption changes insignificantly up to 60 minutes, after which it remains constant, indicating that equilibrium has been reached. This is explained by the fact that at the beginning of the purification process, there are enough active centers on the surface of the adsorbent capable of binding the metal, and after the filling of the surface layers, the internal pores of the adsorbent are filled.

**Figure 3.** *Dependence of the adsorption of metal ions on the contact time for ions ▲ C u(II) and ■ Ni(II)*




The kinetic parameters of the process of adsorption of Cu(II) and Ni(II) ions by an adsorbent based on rice husks are shown in Table 1.

**Table 1.** *Kinetic parameters of the process of adsorption of Cu(II) and Ni(II) ions*

| Adsorbent | Metal | Temperature (K) | Pseudo first order equation | | | Pseudo second order equation | | |
|---|---|---|---|---|---|---|---|---|
| | | | $K_1$ (min$^{-1}$) | $q_e$ (mg × g$^{-1}$) | $R^2$ | $K_2$ (g × mg$^{-1}$ × min$^{-1}$) | $q_e$(mg × g$^{-1}$) | $R^2$ |
| Modified rice husk | Cu (II) | 293 | –0.095 | 24 | 0.976 | 0.00539 | 27.3224 | 0.990 |
| | | 303 | 0.064 | 26 | 0.9382 | 0.0090 | 27.7777 | 0.998 |
| | | 313 | 0.079 | 27.5 | 0.9437 | 0.01667 | 28.490 | 0.999 |
| | Ni(II) | 293 | –0.084 | 16 | 0.971 | 0.00548 | 19.0839 | 0.974 |
| | | 303 | –0.080 | 18 | 0.9329 | 0.010903 | 19.56947 | 0.996 |
| | | 313 | –0.076 | 20 | 0.9167 | 0.01553 | 21.0526 | 0.999 |

It can be seen from the data presented that the values of the correlation coefficients $R^2$ equal to 0.990 for Cu (II) ions and 0.974 for Ni(II) ions for the pseudo-second order model is higher than for the pseudo-first order model with $R^2$ 0.976 and 0.971 for Cu(II) ions Ni (II), respectively, which indicates that the adsorption process is better described by the pseudo second order kinetic model.

## Discussion

Research has confirmed that adsorbents prepared by chemically treating rice husks with an aqueous solution of monoethanolamine are significantly effective in removing copper and nickel ions from aqueous solutions. This rice husk modification method exhibits excellent adsorption properties, especially under optimal conditions such as certain pH values and contact times. Moreover, this approach offers a cost-effective solution given the availability and low cost of the starting material. Thus, modified rice husk with monoethanolamine can be considered as a promising adsorbent for effective water purification from heavy metal ions, which opens up potential for widespread use in industry and in the field of environmental safety.

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# Section 3. Medicine

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## IMPACT OF NEOADJUVANT CHEMOTHERAPY ON IMMUNOHISTOCHEMICAL RECEPTOR STATUS AND LONG-TERM TREATMENT OUTCOMES IN LOCALLY ADVANCED BREAST CANCER: A COMPARATIVE ANALYSIS

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**Abstract**

Locally advanced breast cancer (LABC) presents a formidable challenge within global oncology due to its increasing incidence rates, high mortality, and the urgent need for improved diagnostic and therapeutic approaches. This study investigated the impact of neoadjuvant chemotherapy (NAC) on the immunohistochemical (IHC) receptor status in LABC patients and its correlation with long-term treatment outcomes. A total of 115 patients with locally advanced breast cancer were subjected to NAC, with subsequent analysis of changes in IHC status. Comparative assessments of overall and disease-free survival were conducted between patients with altered and unaltered IHC status post-NAC. The study identified significant differences in survival outcomes based on IHC status changes, highlighting the potential prognostic value of such alterations. The findings underscore the critical need for a more comprehensive understanding of tumor response mechanisms to NAC and its implications for personalized therapeutic strategies. These insights have significant implications for advancing tailored treatment approaches for LABC patients.
**Keywords:** *Locally advanced breast cancer, neoadjuvant chemotherapy, immunohistochemical status, treatment outcomes*

**Relevance** Metastatic breast cancer (MBC) remains a significant challenge within global oncology. Increasing incidence rates, high mortality, and the deterioration of epidemiological indicators make MBC a subject for intense scientific research and a continuous improvement in medical service. A key role in the management of MBC is played by the update of diagnostic methods to provide timely decisions regarding the initiation of

therapy or surgical intervention. There has been a change in the approach to early diagnosis, while the influence of various predictors on the outcome of the disease and the analysis of optimal therapy methods are actively studied.

## Materials and Methods

All patients were diagnosed with locally advanced breast cancer and had undergone neoadjuvant chemotherapy (NAC).

**Group Division:** The patients were divided into two groups. The primary group consisted of 66 patients who experienced a change in immunohistochemical (IHC) receptor status following NAC. The control group comprised 49 patients whose IHC status remained unchanged after NAC.

**Treatment Methods:** Neoadjuvant chemotherapy was applied according to standard protocols for the treatment of locally advanced breast cancer, adapted to the individual disease course, health condition of the patients, and their previous treatment.

**IHC Status Evaluation:** The assessment of IHC status was conducted before the start of NAC and after its completion. The status was determined by examining the expression of estrogen and progesterone receptors, as well as HER2/neu on the membrane of tumor cells using immunohistochemistry methods.

Statistical analysis was performed using the StatTech v. 4.0.4 software (developed by LLC "Stattech", Russia).

Quantitative indicators were assessed for normal distribution with the Shapiro-Wilk test (for a sample size of fewer than 50) or the Kolmogorov-Smirnov test (for a sample size over 50).

Quantitative indicators with a normal distribution were described using mean arithmetic values (M) and standard deviations (SD), and the boundaries of the 95% confidence interval (95% CI).

In the absence of a normal distribution, quantitative data were described using the median (Me) and the lower and upper quartiles (Q1 — Q3).

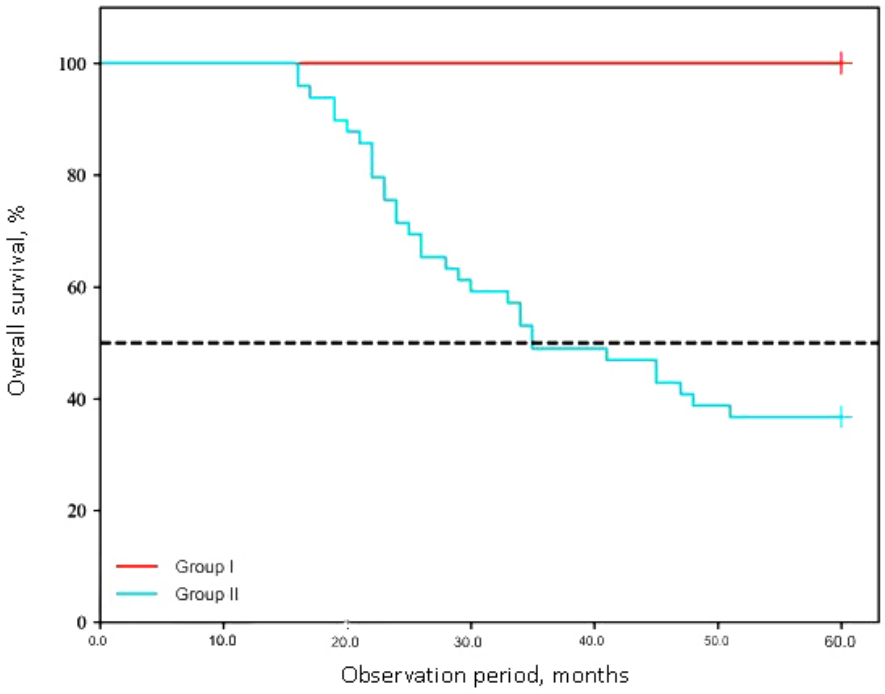
Categorical data were described by indicating absolute values and percentage shares.

For comparative analysis of NAC efficiency in both groups, statistical methods were employed. The statistical significance of differences in IHC status before and after NAC was assessed using the chi-squared test and/or t-test, depending on the variable distribution. The significance threshold for all tests was set at $p < 0.05$.

## Results

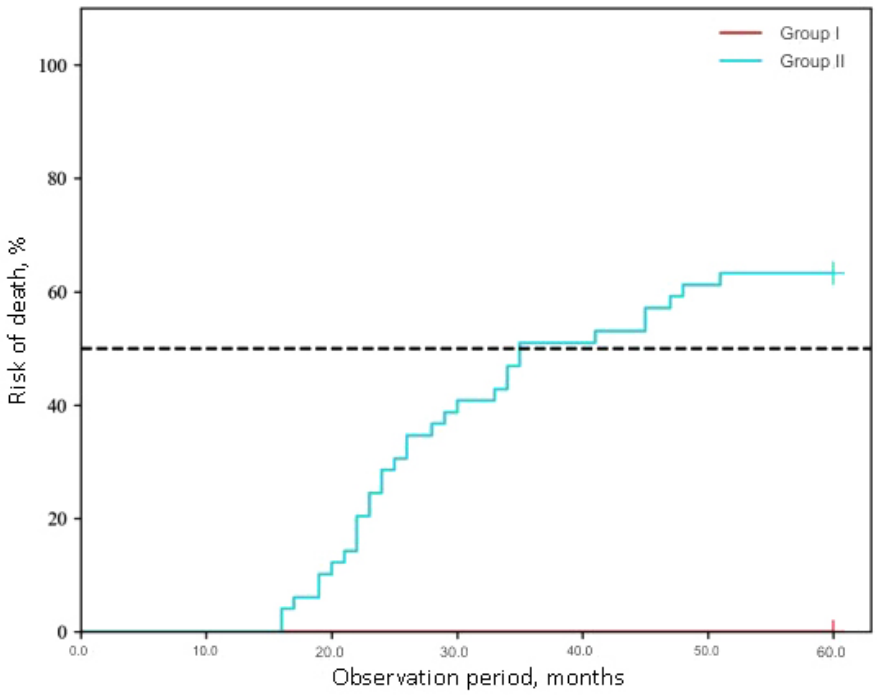
An analysis of overall survival depending on the treatment groups was conducted.

**Figure 1.** *Survival curve depending on the distribution of patients across treatment groups*



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Group I | | | | | | | |
| Observations | 66 | 66 | 66 | 66 | 66 | 66 | 0 |
| Censored | 0 | 0 | 0 | 0 | 0 | 0 | 66 |
| Events | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| Group II | | | | | | | |
| Observations | 49 | 49 | 43 | 29 | 24 | 19 | 0 |
| Censored | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| Events | 0 | 0 | 6 | 20 | 25 | 30 | 31 |

**Figure 2.** *Mortality risk curve depending on the distribution of patients across treatment groups*





| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Group I | | | | | | | |
| Observations | 66 | 66 | 66 | 66 | 66 | 66 | 0 |
| Censored | 0 | 0 | 0 | 0 | 0 | 0 | 66 |
| Events | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| Group II | | | | | | | |
| Observations | 49 | 49 | 43 | 29 | 24 | 19 | 0 |
| Censored | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| Events | 0 | 0 | 6 | 20 | 25 | 30 | 31 |


| Observation | Group I | | Group II | |
|---|---|---|---|---|
| period | Risk of Mortality | 95% CI | Risk of Mortality | 95% CI |
| 0.0 | 0.0 | 0.0–0.0 | 0.0 | 0.0–0.0 |
| 10.0 | 0.0 | 0.0–0.0 | 0.0 | 0.0–0.0 |
| 20.0 | 0.0 | 0.0–0.0 | 12.2 | 25.2–5.7 |

| Observation period | Group I | | Group II | |
|---|---|---|---|---|
| | Risk of Mortality | 95% CI | Risk of Mortality | 95% CI |
| 30.0 | 0.0 | 0.0–0.0 | 40.8 | 55.8–28.6 |
| 40.0 | 0.0 | 0.0–0.0 | 51.0 | 65.5–38.0 |
| 50.0 | 0.0 | 0.0–0.0 | 61.2 | 74.7–48.0 |
| 60.0 | 0.0 | 0.0–0.0 | 63.3 | 76.4–50.0 |

**Overall Survival:** The analysis of overall survival was carried out by tracking the condition of patients over a set period after the completion of NAC. The overall survival, defined as the interval from the start of treatment to death from any cause or the latest observation, averaged 3 years in the primary group (95% CI: 2.6–3.4). In the control group, this indicator was slightly lower, averaging 2.5 years (95% CI: 2.1–2.9).

**Disease-Free Survival:** Disease-free survival, measured as the period from the end of NAC to the first registered case of disease recurrence or dropout for other reasons, had a median of 2 years in the primary group (Q1 — Q3: 1.5–2.5). In the control group, the median of disease-free survival was less, at 1.5 years (Q1 — Q3: 1.1–1.9).

**Analysis Based on Literature Data:** The literature review indicates that patients with MBC post-NAC often demonstrate an improvement in overall survival rates due to more aggressive and targeted treatment. Changes in IHC status may correlate with a low risk of recurrence, and consequently, higher values of disease-free survival. However, these results require further validation by larger studies. It is also important to consider factors such as age, overall health, the presence of comorbid conditions, and adherence to NAC protocols, which also play a significant role in determining both overall and disease-free survival.

## Conclusion

The findings of this study underscore the need for a deeper understanding of the mechanisms of tumor response to NAC and its impact on long-term treatment outcomes, which could form the basis for the development of more personalized and effective therapeutic approaches in the future.

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# MODERN VIEW ON THE PROBLEMS OF ACCOMPANYING THERAPY IN GYNECOLOGICAL ONCOLOGICAL PATHOLOGY. Epidemiology of gynecological oncology pathology (Review article)

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**Abstract**

According to GLOBOCAN2020, cervical cancer, ovarian cancer and uterine cancer are among the ten most common cancers in women worldwide. Many studies have shown a positive correlation with age for all four types of female cancer. Due to future demographic changes, including falling parity and the aging of the baby boom generation, the average age in some countries will continue to rise. In the United States, the incidence of ovarian cancer is estimated to increase by 37%, from 20,921 cases in 2020 to 28,591 cases in 2030.

**Keywords:** *ovarian cancer, uterine cancer, female cancer*

## Introduction

According to the GLOBOCAN2020 project, cervical cancer, ovarian cancer and uterine cancer are among the ten most common cancers in women worldwide (FIGO Committee on Gynecologic Oncology. 2019; Amit A., Schink J., Reiss A. et al. 2011; Shepherd J. H., Spencer C., Herod J., Ind T. E., 2006). Many studies have shown a positive correlation with age for all four types of female cancer. Due to future demographic changes, including falling parity and the aging of the baby boom generation, the average age in some countries will continue to rise. In the United States, the incidence of ovarian cancer is estimated to increase by 37%, from 20,921 cases in 2020 to 28,591 cases in 2030 (Ramirez P., Frumovitz M., Pareja R. et.al., 2018; Elliott P., Coppleson M., Russell P. et al. 2000; Whitney C. W., Sause W., Bundy B. N. et al.; Radzinsky V. E., Ordiyants I. M., Abdurakhmanova M. B., Zhang Q. et al. 2017). This increase in ovarian cancer cases is mainly attributed to changes in age distribution and population growth (Elliott P., Coppleson M., Russell P. et al. 2000). Given the aging trend, the burden of women's cancers may continue to increase in the coming decades.

Cervical cancer in regions with a low socio-demographic index is the most common gynecological cancer. Relatively, ovarian cancer and uterine cancer were more common in regions with a high socio-demographic index. Female cancer causes numerous deaths worldwide and places a heavy economic burden on women and their families. With global population aging, international efforts are needed to reduce cancer incidence and mortality among women and improve women's health. Although cervical cancer can be prevented through HPV vaccination and screening for precancerous lesions, the incidence and mortality of cervical cancer in these counties is still high due to lack of necessary medical interventions (Huang H., Liu J., Li Y. et al.; Sedlis A., Bundy B.N., Rotman M.Z. et al.; Morris M., Eifel P.J., Lu J. et al. 1999; Whitney C.W., Sause W., Bundy B.N. et al. 1999; Lanciano R.M., T.F., Martz K., Hanks G.E. 1993). Compared to cervical cancer, ovarian cancer and uterine cancer are less common worldwide (Lorusso D., Petrelli F., Coinu A. et al. 2014; Pötter R., Haie-Meder C., van Limbergen E. et al., 2006). Overall, the incidence and mortality of the four types of cancer in women has continued to rise over recent decades.

Epidemiological patterns of cancer in women vary between regions and change over time. Systematic analyzes that comprehensively reflect trends in cancer incidence in women help policymakers measure the burden of cancer in women, build health care infrastructure, and allocate public health resources. In this cross-sectional study, we reported the incidence, mortality, and disability-adjusted life years of female breast cancer, cervical cancer, ovarian cancer, and uterine cancer from 1990 to 2019 in 204 countries. In addition, we analyzed the correlation between the morbidity or mortality rate and the sociodemographic index (Webb J.C., Key C.R., Qualls C.R. et al., 2001; Kvetnoi I., Kvetnaya T., Bocharova K. 2014).

## Main part

In the Cervical Cancer Study, age-standardized incidence, mortality, and DALY rates were negatively correlated with the sociodemographic index. Relatively, morbidity and mortality rates were significantly higher in these low-source countries. Carcinogenic HPV infection has been confirmed to be the main cause of cervical cancer (Maltseva A.N. 2018; Rogovskaya S.I. 2013; Rodríguez A.C., Schiffman M., Herrero R. et al., FIGO Committee on Gynecologic Oncology. 2019; (Maltseva A.N. 2018; Rogovskaya S.I. 2013; FIGO Committee on Gynecologic Oncology. 2019). In recent decades, due to the introduction of HPV vaccination and HPV-based screening, the incidence of cervical cancer has continued to decline (FIGO Committee on Gynecologic Oncology. 2019; Radzinsky V.E., Ordiyants I.M., Abdurakhmanova M.B. 2018). Also, based on microscopic examination of cervical scraping smears, treatment of precancerous lesions is secondary prevention of cervical cancer (Orazov M.R., Radzinsky V.E., Khamoshina M.B., Nosenko E.N., Dukhin A.O., Tokaeva E.S., Barseghyan L.K., Shkreli I., Marapov D.I., Simenel D.A., Nizhnik A.N. 2018). However, in some developing regions, such as southern sub-Saharan Africa, most women find it difficult to access effective interventions (Orazov M.R. and other 2018). Thus, it is critical to implement basic population prevention and screening programs in these regions, including the introduction of vaccination, screening for cervical cancer and precursor lesions. It is estimated that implementation of the WHO cervical cancer assessment strategy could significantly reduce cervical cancer mortality by 99% over the next century (Amit A., Schink J., Reiss A. 2011). Literature data have shown that the incidence of ovarian cancer varies depending on geographic location and is positively associated with the value of the socio-demographic index. Less breastfeeding, infertility or absence of pregnancies, hormonal treatment and obesity are risk factors for ovarian cancer (Bermudez A., Bhatla N., Leung E. 2015). In contrast, oral contraceptives are a strong protective factor against ovarian cancer (Kjaer S.K., Frederiksen K., Munk C., Iftner T. 2010; Kaprin A.D., Starinsky V.V., Petrova G.V. 2019; FIGO Committee on Gynecologic Oncology. 2019).

Previous studies have shown that oral contraceptives may inhibit carcinogenesis by interfering with estradiol production and reducing menstrual cycle estradiol ex-

posure (Usmanova E. B., Obukhova O. A., Shchelkova O. Yu. 2020; Thornquist C. 2018; Rodríguez A. C., Schiffman M., Herrero R. 2010). The high incidence of ovarian cancer in regions such as Western Europe and North America may be due to the high prevalence of these risk factors. In some developed countries, including the United States, the decline in incidence has been accompanied by a decline in mortality over the past 30 years. The development of treatment methods for ovarian cancer, including targeted therapy, neoadjuvant chemotherapy, intraperitoneal chemotherapy, and aggressive surgery, helps reduce the mortality rate of gynecological cancer (Webb J. C., Key C. R., Qualls C. R. 2001; Ramirez P., Frumovitz M., Pareja R. 2018).

## Conclusion

The incidence of uterine cancer is increasing throughout the world, especially in regions with high socio-demographic index levels. According to GBD2019, the age-standardized incidence rate of uterine cancer in the United States increased from 19.63 in 1990 to 28.80 in 2019. Obesity has been a vital risk factor contributing to the increased incidence of uterine cancer (Solopova A. G., Idrisova L. E., Vlasina A. Yu., Moskvicheva V. S. 2018; Kim H. S., Sardi J. E., Katsumata N. 2013; Gupta S., Maheshwari A., Parab P. 2018; Tian Zhong-ze, Li Sha, Wang Yue 2014). Women who are overweight or obese are more likely to develop uterine cancer than women of normal weight (Lorusso D., Petrelli F., Coinu A. 2014; Morley G. W., Hopkins M. P., Lindenauer S. M. 1989). In addition, decreased physical activity and a higher prevalence of diabetes are also risk factors for uterine cancer (Mabuchi S. 2016; Maltseva A. N. 2018; Wang S. 2010; Sapienza L. G. 2018). Public health programs that help women maintain a healthy weight and increase physical activity can reduce the risk of uterine cancer.

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## FOREIGN POLICY PROJECTS OF REGIONAL AND GLOBAL SECURITY OF KAZAKHSTAN

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**Abstract**

Kazakh foreign policy projects make a significant contribution to strengthening regional and global security. Effective consultative mechanisms have been created through the Ministries of defense, Law enforcement agencies, and the Judiciary, with the help of which the participating states consult and coordinate actions on regional and international issues, provide mutual support to each other and establish close cooperation on the most important international and regional issues.

**Keywords:** *Organization for Security and Cooperation in Europe (OSCE), the principle of multi-vector policy of Kazakhstan, Shanghai Cooperation Organization (SCO), SCO Development Strategy until 2025, SCO Program in the fight against terrorism, separatism and extremism, SCO Food Security Program, Conference on Interaction and Confidence Building Measures in Asia (CICA), CICA Confidence Building Buildings Catalog, Astana Summit, Organization for Security and Development in Asia (OSDA), CICA Council of the Wise, CICA Think Tank Forum, CICA Council on Sustainable Connectivity, CICA Financial Summit*

### Organization for Security and Cooperation in Europe (OSCE)

The development of cooperation with various international security structures corresponds to the principle of Kazakh multi-vector policy and meets the interests of strengthening its national security. In the European direction, this is, first of all, the OSCE. The scope of the OSCE's activities extends far beyond the geographically defined borders of Europe. The countries of Central Asia, along with non-European states, contribute to maintaining security throughout the OSCE area. Central Asia is a kind of outpost for Europe in countering such new threats as uncontrolled migration flows, the expanding drug trade, organized crime, religious extremism and terrorism. The decisions to open OSCE **c**enters in the countries of Central Asia were very important. The Kazakh leader is committed to the idea that the central function of the new model of Eu-

ropean security in the 21st century should be performed by the OSCE, and in this vein, Kazakhstan will cooperate with this organization. The OSCE has a wealth of experience in the formation and development of the pan-European process, experience in establishing dialogues to build trust and develop relations between states. The OSCE was a stabilizing institution during the existence of the USSR and Eastern Europe. The OSCE is the only universal organization of European states. The OSCE is an organization guided by the principles of consensus, guaranteeing the rights of all its members.

Kazakhstan has become a bastion of peace and stability in the historically turbulent Central Asian region. And as the future chairman of the OSCE, Kazakhstan, under the leadership of Nazarbayev, will be able to contribute to the so-called dialogue of civilizations based on tolerance and mutual enrichment of cultures of East and West. According to the current practice in the Organization for Security and Cooperation in Europe, Kazakhstan, which chaired the OSCE in 2010, in the period 2009–2011 will be one of the leader in "Three countries of the Organization". Thus, the Head of State signed a Decree on the opening of a separate Permanent Mission of the Republic of Kazakhstan in the OSCE. Since July 2008, the Kazakh Foreign Ministry has had a separate department in charge of OSCE topics, which during the chairmanship will be entrusted with the functions of a specialized Task Force (the so-called OSCE Task Force – a key structural element of the chairmanship's interaction with OSCE institutions and participating countries).

The OSCE is not just a security organization uniting 56 states, but a structure based on "common humanitarian values." A distinctive feature of the OSCE as a comprehensive security organization is that its documents are created through a process that does not require legally binding norms and principles. OSCE documents do not have legal accountability mechanisms. They represent more than a simple declaration of will or good intentions. Compliance with OSCE standards serves as an indicator of the democratic maturity of the political system and the effectiveness of the state authorities. If considerable time is required to discuss international legal documents, and the final documents are subject to ratification, this does not apply to OSCE documents. If consensus is reached between states, decisions enter into force immediately and are binding on all OSCE participating states based on the principle of voluntariness and universality. The OSCE is not only an organization based on "common democratic values", but an organization of "shared responsibility". This responsibility presupposes the right not to criticize other states, but imposes obligations to help each other in solving specific problems (Lukpanova S., 2008).

The OSCE has created human dimension accountability mechanisms – Vienna and Moscow. Together they formed an instrument for monitoring the implementation of human dimension commitments. The OSCE has established a number of institutions to assist participating states in fulfilling their human dimension commitments. This is the Office for Democratic Institutions and Human Rights, the High Commissioner on National Minorities, and the Representative on Freedom of the Media. The main priorities of the OSCE are reforming the OSCE, overcoming regional conflicts, combating terrorism and drug trafficking, promoting democratic processes, combating human trafficking, promoting tolerance and freedom of religion (Sarsembayev M.A., 2008).

Kazakhstan has unique experience that can be useful to OSCE participating countries in overcoming ethnic intolerance. The Assembly of Peoples is Kazakhstan's know-how in ensuring social stability and interethnic harmony. According to the latest amendments to the Basic Law, the Assembly received a constitutional status, providing it with the opportunity to express the interests of all ethnic groups of Kazakhstan in social and political life. The participation of Assembly members in the work of Parliament is a new experience throughout the OSCE area. Through its chairmanship in the OSCE, Kazakhstan will be able to move to a new qualitative stage of development, to high intellectual heights, to new horizons of cultural and spiritual development.

The OSCE is an important element of the Euro-Atlantic and Eurasian security architecture, and its full participation in the

activities provides us with a unique opportunity to expand multilateral cooperation in all three dimensions – military-political, economic-environmental and humanitarian, to provide framework conditions for strengthening confidence-building measures, and to give additional impetus to transformations in Kazakhstan and the Central Asian region. Kazakhstan held a number of events that contributed to the promotion of the three dimensions of the OSCE. On May 17, 2006, an OSCE regional conference on combating human trafficking was held in Astana, and on June 12–13 in Almaty, an OSCE meeting "Intercultural, interreligious and interethnic understanding" was held with the participation of the OSCE leadership, representatives of the organization's member states, academic and religious communities, and civil society. For the first time within the OSCE, the importance of tolerance was especially emphasized as one of the main factors of stability, especially in the context of globalization, the emergence of new challenges and threats. The need to maximize the use of the OSCE potential for the development of dialogue between religions, cultures and civilizations was highlighted.

In the military-political dimension, on May 29 – June 2, 2006, the third conference which was dedicated to the Treaty on Conventional Armed Forces in Europe (CFE) was held in Vienna under the chairmanship of Kazakhstan. The result of close cooperation between the Parliament of Kazakhstan and the OSCE was the holding of the 17th annual session of its Parliamentary Assembly in Astana from June 28 to July 3, 2008. Speaking at the opening of the OSCE PA session, N.A. Nazarbayev noted that "parliamentary diplomacy plays a key role in ensuring an atmosphere of trust and mutual understanding throughout the OSCE area" (Aspendiyarova A. 2008). He also drew the attention of the participants to the fact that, having been elected as a chairman of the organization, Kazakhstan aims to strengthen this forum for equal dialogue, exchange of positive experience and search for effective solutions.

As a chairman, Kazakhstan under the leadership of N.A. Nazarbayeva will focus on the problems of ensuring stability and security, strengthening tolerance and non-discrimination, especially on ethnic and religious grounds, and countering international terrorism. As a chairman of the OSCE, Kazakhstan is given the opportunity to successfully position Kazakhstan initiatives on various problems of our time. Perspective areas during Kazakhstan's presidency of the OSCE may include issues of Roma and Sinti, ensuring their full integration into the societies in which they live; the problem of domestic violence and gender discrimination; migration issues, the solution of which is possible only at the regional level; the problem of shortage of drinking water, as well as water intended for irrigation of agricultural land; energy problems. As a result of globalization processes, economic, financial, and mortgage crises have become periodic and systemic, which threatens the normal functioning of both the world economy and national economies. It seems timely to include on the OSCE agenda the issue of developing and adopting preventive measures to counter regional and global economic and financial crises. Also, a number of experts make a proposal to OSCE participants to revive the Great Silk Road, which in ancient times and the Middle Ages consisted of a number of branches and lines, in a railway version. Goods from China, Japan, and Southeast Asian countries in transit through Kazakhstan, Russia, and Belarus could arrive in Europe (Sarsembayev M.A., 2008).

According to experts, in recent years the OSCE has been increasingly involved in oversight functions that are unusual for it. The organization became overly interested in studying the contents of the third (humanitarian) basket. At the same time, the OSCE almost abandoned the main idea: the military-political and economic direction of activity, which was the goal of its creation by the participating states. This is the essence of the current OSCE crisis. The organization "has run out of steam in terms of initiatives. Kazakhstan chairmanship will allow the OSCE to emerge from the crisis (Solozobov, Yu. 2009).

The chairmanship of Kazakhstan in the OSCE is recognition of real achievements in the field of building a democratic society and a liberal market economy. This is a recognition of the international authority of the Head of State, who ensured interethnic and interfaith harmony and political stability in Kazakh so-

ciety. The chairmanship of Kazakhstan will become an important factor in building a safe, stable and predictable Central Asia, and will play a key role in the development of transit and transport dialogue within the OSCE for landlocked countries, solving environmental and many other problems of the region. The Kazakh leader demonstrates an international format the principles of global responsibility, the rejection of confrontational models, and the multi-vector nature of the formation of a regime of trust and strategic dialogue.

## Shanghai Cooperation Organization (SCO)

Ehe Shanghai Cooperation Organization is one of the most promising and effective regional institution with the participation of Kazakhstan. Membership in the SCO allows us to resolve issues of ensuring regional security through the joint fight against international terrorism, religious extremism, national separatism, illegal drug trafficking, weapons and illegal migration.

In 1996, in Shanghai, the heads of five states (Kazakhstan, Russia, China, Kyrgyzstan and Tajikistan) signed an agreement to strengthen confidence-building measures in the military field on the territory of the joint borders of these states. The main objectives of the Shanghai Five, then the SCO, were to counter international terrorism, drug trafficking, arms smuggling, illegal migration and other forms of cross-border criminal activity. Since December 1999, this work has been coordinated by the so-called "Bishkek Group" of heads of law enforcement agencies and intelligence services, whose meetings were regularly held in the capital of Kyrgyzstan. At a meeting of the Bishkek group in December 2001, a project to create a regional anti-terrorist structure within the SCO was first announced.

From the very beginning of its existence, the SCO declared one of its main tasks to be countering the so-called "three evils": terrorism, separatism and religious extremism (UN Charter. Chapter VIII). The transformation of the "five" into the SCO took place at a summit in Shanghai in June 2001, in which Uzbekistan took part, having applied at the beginning of the year to join the "Shanghai Five". Following the meeting, the heads of six states signed the Declaration on the Establishment of the SCO and the Shanghai Convention on Combating Terrorism, Separatism and Extremism. The latest document clearly indicated the directions and forms of combating them (Declaration on the establishment of the Shanghai). The goals of the SCO were declared to be 'strengthening mutual trust, friendship and good neighbourhood between the participating states; encouraging effective cooperation between them in political, trade, economic, scientific, technical, cultural, educational, energy, transport, environmental and other fields; joint efforts to maintain and ensure peace, security and stability in the region, to build a new democratic, fair and rational political and economic international order' (Declaration on the establishment of the Shanghai). The Council of National Coordinators (CNC) was formed to organize interaction between ministries and departments of the SCO state members.

As a result of the summit in St. Petersburg on June 7, 2002, the Charter of the Shanghai Cooperation Organization was adopted. the following tasks were identified as priority goals: strengthening mutual trust, friendship and good neighbourhood between member states; development of multidisciplinary cooperation in order to maintain and strengthen peace, security and stability in the region, promote the construction of a new democratic, fair and rational political and economic international order; joint counteraction to terrorism, separatism and extremism in all their manifestations, the fight against illegal drug and weapons trafficking, other types of transnational criminal activities, as well as illegal migration" (Charter of the Shanghai Cooperation Organization). At the summit the decision was made to create the SCO Regional Anti-Terrorism Structure (RATS). Its main tasks were identified as: participation in the preparation of draft international legal documents on issues of terrorism, separatism and extremism, taking measures to create, together with the UN Security Council and its anti-terrorism committee, international and regional organizations, a mechanism for effective regulation of global challenges and threats; collection and analysis of information provided by member states on the fight against terrorism, separatism and

extremism, creation of a data bank of the anti-terrorist structure, introduction of considerations for the deployment of the organization cooperation in the fight against the "three evils". In 2005, in Astana, the heads of the SCO member states decided to establish the institution of permanent representatives at the RATS.

The Kazakh leader is one of the main and guiding authors of the SCO idea. This is manifested in the activities of the Council of Heads of State, in the position of representatives of the Kazakh side, in various SCO organizations. During 2008, the main events within the SCO were the meetings of the Councils of Heads of State – CHS (August 28, 2008, Dushanbe), the Council of Heads of Government – CHG on October 30, 2008, Astana. On October 30, 2008, a regular meeting of the SCO CHG was held in Astana, where the heads of government signed a Joint Communiqué, approved the budget of the organization for 2009, a Report of the SCO Secretariat on the progress of the implementation of the Multilateral Trade and Economic Cooperation Program and an updated Action Plan for the implementation of the Multilateral Cooperation Program.

Since the very beginning of the Shanghai process in 1996, Kazakhstan has been an active participant in multilateral interaction in the SCO format. The SCO is not a military alliance; this Organization is aimed to resolve issues that are relevant to member states in two dimensions: regional security and the development of economic cooperation. Within the SCO, attention is paid to the problems of security, strengthening peace and stability on the Eurasian continent. To solve these problems, the SCO Regional Anti-Terrorist Structure was created and is successfully functioning. Joint anti-terrorism training and operations are regularly conducted under its supervision. At the expert level, a mechanism for joint response to situations that threaten peace and stability in the SCO space is being developed. A promising direction is the development and deepening of trade, economic and investment cooperation. For these purposes, new SCO structures have been created – the Business Council and the Interbank Association. There is great potential for cooperation in the field of energy development. Kazakhstan, being one of the major producers and suppliers of energy resources, is interested in creating an integrated energy infrastructure within the SCO. Kazakhstan initiated the development of the Asian Energy Strategy and supported the idea of creating the SCO Energy Club.

Every year the SCO covers new areas of cooperation. In 2006, for the first time, meetings of heads of parliaments, supreme courts, as well as ministers of education of member states of the Organization took place. It means than the organization is being transformed into a multidisciplinary regional structure. The CSTO (the Collective Security Treaty Organization) and SCO are often perceived as a kind of Asian "iron fist" in response to the process of NATO expansion. This is a completely incorrect interpretation of these organizations. The CSTO charter states that the goals of the Organization are to strengthen peace, international and regional security and stability, to protect on a collective basis the independence, territorial integrity and sovereignty of member states, priority in achieving which is given to political means. This organization is open to cooperation with other states and international structures. There are good opportunities for establishing cooperation between the CSTO and NATO. One of the promising areas of such cooperation could be measures to combat the illegal distribution of drugs. There are favourable prospects for cooperation between the OSCE and the CSTO in such areas as the fight against terrorism and drug trafficking, and strengthening the borders with Afghanistan. The SCO is not a military alliance. Its goals extend to the development of interaction on issues of combating regional challenges and threats, as well as economic cooperation.

There are also a number of unresolved issues within the SCO that require coordinated approaches from the members of the organization:

1. The existence of economic barriers between the SCO member countries. One of the weak links within the SCO is customs and tax legislation. One of the main tasks of the SCO should be the creation of favourable conditions in the field of foreign trade and mutual investment, which requires accelerating the processes of harmonization of customs and

tariff regulation in the participating countries.

2. Different levels of economic development of the SCO states. Differences in the pace of market transformations and economic development of the SCO countries lead to limited mutual access of industrial, commercial, financial and insurance capital to the markets of partner states and a decrease in economic ties.

3. Low efficiency of implementation of the main cooperation programs within the SCO.

4. Insufficiently high level of coordination of actions, weak information component of projects. The implementation of joint projects of the countries of the organization is not carried out to the full extent due to poor coordination of the actions of the participants of the organization. It is also necessary to create effective channels for disseminating information – this is the creation of a website for regional economic cooperation, publication of information and analytical materials in the media (Solozobov Yu., 2009).

The main priorities in the medium term for the participating states, according to experts, should be transport and energy. In the field of energy, the most promising joint energy projects are the construction of the Atasu-Alashankou oil pipeline (Kazakhstan-China), the project to resume oil pumping through the Omsk-Pavlodar-Shymkent-Chardzhou oil pipeline, cooperation in the field of transit of Central Asian and Russian gas. In the field of transport, the effective use of the transit potential of the SCO countries and the development of transport corridors are important. A promising project within the SCO is the organization of express container trains on the routes Urumqi – Brest and Urumqi – Moscow (A new page in the history of the SCO. 2017).

Nevertheless, the SCO has emerged as a full-fledged international organization and as a factor in the formation of a fair and effective international security architecture.

A new page in the development of the Organization was the Astana SCO summit held in 2017 under the chairmanship of the President of Kazakhstan. For the first time in the history of the Organization, the composition of its participants was expanded due to the admission of new states – India and Pakistan. A clear confirmation of the growing authority of the organization was the participation of UN Secretary-General Antonio Guterres in the SCO summit.

Nowadays, the SCO space, including observer states, covers the territory from the Atlantic to the Pacific Ocean and from the Arctic to the Indian Ocean. The Organization includes two permanent members of the UN Security Council and four states with nuclear potential, two countries with the largest populations on the planet and two of the largest consumers of energy in the world, three of the five BRICS countries."

As President of the Republic of Kazakhstan Kassym-Jomart Tokayev noted in his speech at the SCO Summit on November 10, 2020, 'the SCO today is rightfully considered as an effective tool for strengthening cooperation and trust in a space covering a quarter of the planet's territory, 40% of the Earth's population and a third of global GDP' (Tokayev, 2022).

With the completion of the institutional formation of the SCO, new mechanisms of international cooperation have emerged, which are characterized by a new quality of relationships, taking into account the opinions of each member state. The most valuable thing in the organization's activities is the establishment of an institution for decision-making by consensus, which ensures a high level of trust in cooperation, the desire to better understanding each other, and resolving all issues through dialogue.

Since the creation of the SCO, Kazakh diplomacy has put forward many different ideas, projects, documents and programs within its framework. In particular, at the suggestion of the Kazakh side, such significant initiatives as the signing of an Agreement on cooperation and interaction of SCO member states on border issues, the adoption of the SCO Development Strategy until 2025, the SCO Program in the fight against terrorism, separatism and extremism, the SCO Food Security Program, carrying out the anti-drug operation "Cobweb" in 2019–2020 and others were implemented.

Kazakhstan is the initiator of one of the important bodies of the SCO – the Council of Heads of Government, which resolves fundamental issues of developing interaction in

practical areas, especially in the economic area.

An important contribution of the Kazakh side to expanding interaction between the SCO countries was the formation of mechanisms for cooperation on border issues, the development of proposals to identify, prevent and suppress the use of the Internet for terrorist, separatist and extremist purposes, in the field of food security, healthcare, science and technology.

The SCO Development Strategy until 2025, adopted at the Ufa summit in 2015, gave impetus to the dynamic development of cooperation. This policy document reflects not only the prospects for cooperation in the political and economic spheres, but also provides ways and directions for timely resolution of accumulated regional problems, including issues of ensuring environmental and food security (Tokayev, 2022).

Currently, a number of important initiatives of Kazakhstan are being worked out within the SCO, such as the adoption of a Roadmap to increase the share of national currencies in mutual settlements of member states, the formation of a pool of modern technology parks, strengthening the potential of the SCO Regional Anti-Terrorist Structure (RATS) by creating an Information Security Centre on its basis, creation of the Eurasian Financial Advisory Mechanism, compilation of the Register of SCO environmental problems requiring urgent collective solutions.

Since 2006, such economic cooperation structures as the Interbank Association and the SCO Business Council have been operating within the SCO. Their tasks are to organize a mechanism for financing and banking services for investment projects, to create favourable conditions for regular dialogue between the business community of the member states in order to expand economic cooperation.

Since December 2004, the SCO has a status of an observer at the UN General Assembly. In 2010, a Joint Declaration of Cooperation was signed between the UN Secretariat and the SCO.

At the Kazakh initiative, the SCO signed Memorandums of Understanding with the Conference on Interaction and Confidence Building Measures in Asia (2014) and the Astana International Financial Centre (2019), a Protocol on Cooperation between the SCO RATS Executive Committee and the Central Asian Regional Information Coordination Centre for Combating with illicit trafficking in narcotic drugs, psychotropic substances and their precursors (2010). Unlocking the potential for cooperation in the Eurasian space will be facilitated by the establishment of formalized relations between the SCO and the Eurasian Economic Commission.

The approaches of Kazakhstan to further implementation of cooperation in the economic and transit-transport spheres are carried out within the framework of the new economic policy "Nurly Zhol", as well as its interface with the Belt and Road Initiative, known within China as 'One Belt, One Road' initiative. In this project the SCO can play a crucial role in the development of the transit and transport potential of Central Eurasia, taking into account such projects as the international transport corridor "Western Europe – Western China" and the growth of freight transportation by rail between Europe and Asia. At the same time, important transport roads of international importance may pass through the territory of each member state.

In September 2022, President Tokayev took part in a meeting of the Council of Heads of State – members of the SCO, held in Samarkand. The summit of the Shanghai Cooperation Organization was organized and hosted by Uzbekistan as the country chairing the SCO. The heads of all member states of the organization gathered at the summit meeting in Samarkand (by the way, the first in-person meeting since the beginning of the pandemic): President of Kazakhstan Kassym-Jomart Tokayev, President of Uzbekistan Shavkat Mirziyoyev, Prime Minister of India Narendra Modi, President of the People's Republic of China Xi Jinping, President of Kyrgyzstan Sadyr Japarov, Prime Minister of Pakistan Shahbaz Sharif, President of Russia Vladimir Putin and President of Tajikistan Emomali Rahmon.

The activities of the SCO have convincingly demonstrated the relevance of the fundamental principles formulated in its statutory documents: the fight against the "three evils", that is, extremism, terrorism, separatism; as well as the protection of the sovereignty and territorial integrity of states;

non-interference in internal affairs. During the meeting Kassym-Jomart Tokayev emphasized that the main priority of the SCO remains strengthening regional security (UN Charter.– Chapter VIII).

The SCO member states account for about a quarter of the world's GDP, that is, more than $23 trillion. We have at our disposal the richest reserves of energy resources, coal, rare metals and sources of renewable energy. There is no confrontation and willing to create different alliances in the ideological and institutional foundations of the organization. They contribute to the growth of international authority and popularity of the SCO.

The priority trends of economic cooperation are the transit and transport sector, food and energy security. A major success in improving logistics connectivity was the adoption of the Concept of cooperation between the SCO countries on the development of effective economic and transport corridors. We discuss rail transportation in the China-Europe direction and the Trans-Caspian International Transport Route, as well as plans for the construction of a third railway crossing point on the border of Kazakhstan and China. The Kazakhstan-Turkmenistan-Iran railway has serious potential, which opens the shortest route from East Asia to the countries of the Persian Gulf. Transit and transport cooperation between Kazakhstan and the states of Central Asia is developing dynamically. Kazakhstan advocates the creation of new and modernization of existing multimodal transport corridors and logistics centres (UN Charter.– Chapter VIII).

The key outcome document was the Samarkand Declaration, which reflected the common approaches of the SCO countries to solving regional and global problems and outlined priorities for the further development of the organization. The leaders decided to improve the activities of the SCO in order to increase the effectiveness of the SCO in responding to increasing challenges and threats, as well as to determine the vector of its development for the long term. A set of proposals will be prepared to adapt the organization to modern realities. A number of programs and plans for cooperation have also been adopted in such important areas as promoting industrial cooperation, the usage of renewable energy sources, infrastructure development, the development of digital literacy and artificial intelligence, and interregional trade.

A memorandum of Iran's obligations was signed, which opens a direct path to this country's full membership in the SCO. The legal registration of the status of SCO dialogue partner Egypt and Qatar has been completed by signing the relevant memorandums. A decision was made to begin the procedure for admitting Belarus as a full member of the organization. The leaders also supported the applications of Bahrain, the Maldives, the United Arab Emirates, Kuwait and Myanmar to become an SCO dialogue partner. Today, the organization's space covers a quarter of the Earth's landmass, almost half of the world's population and economic potential.

### Conference on Interaction and Confidence Building Measures in Asia (CICA)

The idea of convening CICA was first voiced by the Head of State in October 1992 at the 47th session of the UN General Assembly. Its essence lies in the desire to create an effective and universal structure for ensuring security in the Asian subcontinent. CICA is an interstate forum for dialogue, consultation, decision-making and implementation of consensus-based measures to strengthen cooperation through the development of multilateral approaches to ensuring peace, security and stability in Asia.

The President of Kazakhstan became the author, developer and first spokesman of the CICA idea and played a key role in its development. When creating the regional subsystem, the Kazakh leader was guided by the UN Charter, the provisions of Chapter VIII ('Regional Agreements'), which was provided for the possibility of the existence of regional agreements or regional organizations to resolve certain issues related to the maintenance of international peace and security that are suitable for regional actions (Speech by the President of the Republic of Kazakhstan N.A. Nazarbayev, 2008). The UN Charter also defined the conditions for the existence of such regional agreements, bodies, their actions and their compatibility with the goals and principles of the UN. It also

identified important principles and forms of interaction between such agreements and bodies. The UN Charter recognizes the possibility of regional systems with an inextricable connection with the UN.

The President also paid attention to the issue of CICA forms. CICA, according to Nazarbayev, was conceived as a union of Asian states in the form of a forum – a meeting for dialogue between leaders, and not as an organization. This form of unification will allow us to maintain the form of dialogue on various controversial issues, views, and positions. Nazarbayev in his book "The Epicenter of the World" scientifically substantiated the most important principles of the organization and activities of the CICA, which were later included in the founding documents of the CICA:

– the principle of organizing the CICA on a regional basis;

– the principle of legal equality of all CICA member states, regardless of their economic, military, political potential and size;

– the principle of mutual respect for sovereignty, the rights to preserve the integrity of the territory of all states with non-interference in each other's internal affairs;

– the principle of resolving all disputes between states by peaceful means;

– the principle of expanding trust between states (CICA: indivisibility of security, strengthening trust. 2021).

On September 24, 2020, Tajikistan handed over the chairmanship of the Conference on Interaction and Confidence Building Measures in Asia (CICA) to Kazakhstan. The meeting of the foreign ministers of the forum member states was held in a video conference format, chaired by the Minister of Foreign Affairs of Kazakhstan, Mukhtar Tleuberdi.

Kazakhstan, relying on the positive experience of previous chairmen – Turkey, China and Tajikistan, planned to intensify work to further advance the CICA process. The Kazakh chairmanship was and is carried out on the principles of openness, impartiality and in accordance with the norms of international law. With globalization, the world is becoming increasingly interconnected and interdependent. As a result, modern challenges are becoming universal. The effectiveness of global governance institutions continues to decline. The system of strategic stability and control over nuclear weapons is being dismantled, accompanied by an arms race and the development of new systems and types of weapons. Terrorism, extremism and drug trafficking are becoming increasingly transnational, mastering modern technologies and new spheres of influence. Changes in the global economic architecture are causing concern. Multilateral cooperation within global platforms is being replaced by trade, investment and technological protectionism. The effectiveness of the World Trade Organization (WTO) is decreasing, and the attractiveness of regional and bilateral alliances is increasing. Cybercrime and incitement to hatred have become an integral part of information wars aimed at manipulating public consciousness, disrupting life support systems and national security (CONCEPT of the chairmanship of the Republic of Kazakhstan. 2020–2022).

Using the example of the spread of the Covid-19 coronavirus infection, it has become obvious that the outbreak of epidemic diseases and pandemics throughout the world can pose an extreme biological threat not only to human survival, but also to national, regional and global economies and security. The most pressing problems remain in ensuring food, energy, water and environmental security. The scale of illegal and uncontrolled migration is growing. Under these conditions, only active collective interaction and open dialogue among civilizations are able to determine the right decisions that ensure stability and sustainable development of all states.

The topic of the chairmanship of Kazakhstan was 'Partnership for security and development in Asia'. In the context of these challenges and threats, the initiative to create an Organization for Security and Development in Asia (OSDA) on the basis of the CICA is especially in demand. This idea was put forward by the First President of the Republic of Kazakhstan – Elbasy Nazarbayev during the 4th Meeting of Foreign Ministers CICA (September 12, 2012) and was subsequently announced by him at Shanghai CICA Summit (May 21, 2014). President of Kazakhstan K. K. Tokayev emphasized that 'to increase efficiency and the international competitiveness of the Forum requires its gradual transformation into a full-fledged

regional organization' during the 5th CICA Summit in Dushanbe.

The transformation of the CICA into an organization will expand its capabilities to strengthen cooperation between states members, to cover the entire Asian space with a system of deep mutual trust and mutual assistance, as well as increase status and influence of forum on the international stage. Implementation of new measures, such as the creation of the CICA Foundation, which was reflected in the Declaration of the Dushanbe Summit, the establishment of the CICA Council of Wise Men, and the transformation of the Forum analytical centres into a permanent site will be contribute to increasing the effectiveness of the Meeting and its authority at the global level. Along with this, the issue of creating a full-fledged Institute of the CICA "Troika" consisting of representatives current, future and previous chairmen of the Meeting, as well as the establishment of the Club of Ambassadors of the CICA member states in Astana with its subsequent transformation into the Council of Permanent representatives. These measures will contribute to further institutionalization of the Forum and will increase the effectiveness interaction between CICA member states.

Kazakh initiatives within the framework of the Meeting are reflected in the Concept of the Chairmanship of the Republic of Kazakhstan in the CICA for 2020–2022. Their nomination is dictated by the dictates of the times and the modern realities of our world (CONCEPT of the chairmanship of the Republic of Kazakhstan. 2020–2022).

One of the important initiatives of Kazakhstan is the creation of the CICA Council of Wise Men, which was proposed by President Kassym-Jomart Tokayev during the CICA Dushanbe summit in 2019. All member states support the creation of this consultative and advisory body.

In addition, in order to strengthen the potential of the CICA Think Tank Forum (TTF), created at the initiative of the People's Republic of China in 2014, the Chairmanship proposed its transformation into a permanent platform for dialogue. In December 2020, the CICA Committee of Senior Officials decided to hold forum meetings on a regular basis. In order to regulate the activities of this mechanism, the chairmanship has developed a draft Regulation on the CICA Think Tank Forum, which will give it the status of a CICA advisory body and provide research and analytical support to member states.

Kazakhstan also developed an updated version of the key document of the Meeting – the CICA Cataloue of Confidence Building Measures, verified and synthesizing its current version of the 2004 model, the Cooperative Approach of 2007 and the Policy for the Implementation of Confidence Building Measures in the Military-Political Dimension of 2013.

The draft updated catalogue includes such new priority areas of cooperation as 'epidemiological safety, public health and pharmaceuticals', 'information and communication technologies', 'counter-terrorism'. Current issues within the framework of the updated priority areas of cooperation have already been widely discussed during a number of events throughout the current year. Among them there is the international video conference 'The Role of Youth in Combating Radicalism, Extremism and Terrorism' (organized by Uzbekistan), the training program for law enforcement officers in analysing crime data (organized by Turkey), the international forum 'Opportunities for cooperation between CICA member states in in the field of digitalization of the economy' (organizer – Kazakhstan), a seminar in the field of energy security on the topic 'Renewable energy sources for energy security' (organizer – India) and many others.

An innovative catalogue confidence measure was created – 'Epidemiological safety, public health and pharmaceuticals.' As part of this measure, Kazakhstan, together with the Halyk charity foundation, donated humanitarian aid to Afghanistan, Iraq and Palestine to combat the COVID-19 pandemic. Kazakhstan has in fact demonstrated its desire to strengthen international cooperation in the fight against the coronavirus pandemic. In addition, in June 2021, Kazakhstan held an online event 'Epidemiological safety and the fight against COVID-19 and other infectious diseases,' which attracted widespread attention from experts from CICA member states. Thus, the updated version of the Catalogue of Confidence Measures is adapted to modern realities.

The pandemic has clearly shown how underestimated the danger of mass infection is. The initiative of the President of Kazakhstan Kassym-Jomart Tokayev to create an International Biosafety Agency, announced by him at the 75th session of the UN General Assembly in September 2020, has become relevant.

In general, within the framework of the Action Plan for the implementation of CICA confidence-building measures for 2021, the chairmanship and member states held more than 50 events on the mentioned five dimensions, including meetings of the Business and Youth Councils, a business forum, a CICA financial summit, a seminar in the military political dimension, forum on tourism development and others. In addition, several meetings of the Committee of Senior Officials (SOC) and the Special Working Group took place. During the SOC meetings, political discussions were organized on the most pressing issues affecting the Asian continent.

Evidence of the growing attractiveness of the Conference is the accession of new states to the CICA activities. Thus, in June of last year, Turkmenistan joined as an observer state. A number of other states are showing an active interest in participating in CICA activities.

The VI summit of the Conference on Interaction and Confidence Building Measures in Asia, chaired by President Kassym-Jomart Tokayev, was held in Astana on October 12, 2022. The work of the VI CICA summit began under the chairmanship of Head of State Kassym-Jomart Tokayev.

Welcoming the meeting participants, the President of Kazakhstan thanked the leaders of the countries participating in the summit and noted that the event was being held in the year of the 30th anniversary of the initiative to convene the meeting. During this period, CICA has become a platform for multilateral cooperation and an international institution of modern diplomacy.

Before starting his speech, the Head of State specifically focused on the fact of expanding the composition of the CICA: Kuwait, which signed two fundamental documents of the meeting (the Declaration of Principles Governing Relations between the CICA Member States of 1999 and the Almaty Act of 2002) officially became a 28th CICA member state. Kassym-Jomart Tokayev congratulated Kuwait on this important decision, which, according to him, demonstrates the relevance of the forum and the need to further strengthen dialogue and cooperation in Asia.

He emphasized that Kazakhstan, as the chairman of the meeting, set itself the task of increasing efforts to further promote processes within the CICA. In 2022, the CICA Catalogue of Confidence Building Measures was revised, which included new priority areas of cooperation, such as epidemiological safety, healthcare and pharmaceuticals, and security of information and communication technologies (CICA: common desire for peace, cooperation and develop. 2022).

The CICA Think Tank Forum operates a universal platform for experts and specialists from all over Asia to exchange experiences and ideas, and implement joint research projects. This year, Astana hosted the CICA Business Council and Business Forum, as well as the Fifth meeting of the Youth Council of the meeting. At the summit, the establishment of the CICA Foundation was announced, the purpose of which is to create a special mechanism for selecting CICA projects and collecting voluntary funds for their implementation. The number of observers and partners is also growing. Turkmenistan joined CICA as an observer. the Head of State said that the decisions were made to establish cooperation with the Eurasian Economic Union and the Association of Southeast Asian Nations (ASEAN).

Kazakhstan has identified a number of ambitious priorities for its chairmanship, which are based on the transformation of CICA into a full-fledged international organization.

The maturity and effectiveness of the CICA as a regional platform for political dialogue serves as a starting point for its further transformation. Member states have repeatedly discussed and, in principle, agree that the CICA is already functioning as a de facto organization. ‘I would like to emphasize that we are not creating a new organization, but are moving to a new stage of institutional development. Raising the status of the meeting will strengthen the increased role of Asia in world affairs and will take the interaction of member states to a new level,’ noted the President of Kazakhstan (CICA: common desire for peace, cooperation and develop. 2022).

The head of state expressed gratitude to all CICA member states that supported Kazakh application for a new chairmanship term in 2022–2024. He emphasized that for the coming two years, the Kazakh chairmanship again sets serious goals for itself and counts on close cooperation and support from member states.

Kassym-Jomart Tokayev focused on the tasks of economic measurement of activity. 'I consider the decision to establish the CICA Council on Sustainable Connectivity to be timely. Disruptions in global supply chains are forcing us to take a fresh look at creating efficient transit and transport corridors. Convenient and accessible ways of transporting goods are an important factor in the sustainable growth of our economies. It is important to concentrate on realizing the transit and transport potential by developing diversified routes for communication and cargo delivery,' said the Head of State (CICA: common desire for peace, cooperation and develop. 2022).

Further he proposed transforming the CICA Financial Summit into a permanent platform. In his opinion, this will contribute to economic recovery, sustainable and inclusive development, and the creation of favourable conditions for regional and subregional financial cooperation within the framework of the meeting.

Regarding the environmental dimension, the President of the Republic of Kazakhstan emphasized that climate change leads to natural disasters, which have become increasingly unpredictable and catastrophic. Only in 2021, they affected 57 million people in Asia. And by 2050, possible damage to Asian economies from such natural disasters could be to up to 26% of GDP. The head of state noted that the recent massive flood in Pakistan had become a large-scale humanitarian disaster, and reaffirmed that in this difficult time, Kazakhstan expresses solidarity with the people and government of Pakistan. The President proposed holding a high-level Conference on environmental issues in the CICA countries in Astana in 2024. The results of this conference can become the basis for the creation of the CICA Council on cooperation in the field of ecology.

The successful holding of a meeting of the Youth Council in Astana in July of this year indicates great prospects for interaction in this direction. In this regard, the head of state proposed holding a meeting of leaders of volunteer movements of CICA countries in Astana in 2024 under the auspices of the Youth Council. The creation of a Partnership Network of leading universities from CICA member states also opens up great prospects. Through this network it would be possible to exchange developments in innovative areas such as IT, nanotechnology and renewable energy sources.

He reaffirmed that Kazakhstan is committed to the further development of the CICA, and expressed confidence that the meeting, given its unique format and geography, has serious prospects and a great future.

An important result of the VI summit of the meeting was the adopted package of documents. First of all, it was the Astana Statement on the transformation of the CICA. The heads of state and government of the member states of the meeting stated that they were launching 'a structured, comprehensive and transparent negotiation process on a gradual, stage-by-stage, consensus-based transformation of the CICA into a full-fledged regional international organization.' The transformation of the meeting will be aimed at identifying key areas of future cooperation and strengthening the organizational and institutional basis for interaction within its framework.

The organization, as stated by its member states, will contribute to ensuring their economic growth, interconnectedness, social and cultural development. Intensifies the search for joint solutions to common problems of the 21st century to ensure the security and prosperity of the region, the peaceful settlement of disputes in accordance with the UN Charter. The organization will interact with other states, organizations and forums that share the goals and principles of CICA.

The statement outlines decisions that will be the first step to implement the transformation process (renaming the meetings of heads of state and government and foreign ministers into "councils", and the position of the Executive Director of the CICA Secretariat into the Secretary General).

The statement also states that member states will determine elements of the transformation process, including membership criteria. The Chairmanship (in this case Kazakhstan),

with the support of the Secretary General and in coordination with Member States, is invited to formulate proposals in 2023 to formulate a roadmap of necessary measures to implement the transformation process.

The Statement of the Heads of State – CICA participants on cooperation in the field of ensuring security in the field of using information and communication technologies and information and communication technologies themselves, the Regulations on the CICA Foundation and the CICA Action Plan for the implementation of the Global Counter-Terrorism Strategy of the United Nations were also adopted.

In addition, a decision was made on the issues of chairmanship of the association in 2022–2024 – this post remains with Kazakhstan for the new two-year period. 'Kazakhstan, as the initiator of the CICA process, will remain committed to the further development of our organization for the benefit and in the interests of all its member states,' said the President of the Republic of Kazakhstan (UN Charter.– Chapter VIII).

As a result of the VI CICA summit, the following documents were adopted:

- Astana Statement on the Transformation of the CICA;
- Granting Kuwait the status of a CICA member state;
- Regulations on the CICA Fund and the creation of a special mechanism for identifying and implementing CICA projects;
- CICA Action Plan for the implementation of the United Nations Global Counter-Terrorism Strategy;
- Statement by CICA leaders on cooperation in the field of security of information and communication technologies (ICT) and their use;
- Decision on the next CICA chairmanship for 2022–2024 (Kazakhstan will chair again).

The Kazakhstan's chairmanship will be focused on further development of the CICA legal framework with the aim of creating effective institutions and mechanisms in the field of ensuring comprehensive, equal and indivisible security of the Asian continent.

Over the years of the Forum's functioning, 5 summits and 5 ministerial meetings were held, at which the basic principles of activity and fundamental statutory documents of the CICA were adopted. The main objective of the Forum was to create favourable conditions for discussing current issues and problems in the field of security between Asian states through open and constructive dialogue based on the principles of international law and the unacceptability of politics from a position of power, differences in economic development, racial, ethnic and religious affiliation.

Over the 30 years of its existence, the Forum has become a dialogue platform for a frank exchange of views on problematic issues of international politics and has contributed to strengthening mutual understanding between them. The increase in the number of CICA members to 28 states, along with eight countries and five organizations with observer status, confirms the relevance and relevance of this platform.

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