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ANALYSIS AND COMPARISON OF SOME INDICATORS OF LIFE SAFETY IN UKRAINE IN THE ASPECT OF SUSTAINABLE DEVELOPMENT

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АНАЛІЗ НА ПОРІВНЯННЯ ДЕЯКИХ ПОКАЗНИКІВ БЕЗПЕКИ ЖИТТЯ В УКРАЇНИ В АСПЕКТІ СТАЛОГО РОЗВИТКУ

Комариста Б. М., Бендюг В. І.

АНАЛИЗ И СРАВНЕНИЕ НЕКОТОРЫХ ПОКАЗАТЕЛЕЙ БЕЗОПАСНОСТИ ЖИЗНИ В УКРАИНЕ В АСПЕКТЕ УСТОЙЧИВОГО РАЗВИТИЯ

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From the point of view of sustainable development of Ukraine, the article analyzes the Security of Life Component as a component of sustainable development. The Security of Life Component in Europe and Central Asia is analyzed in comparison with the Security of Life Component in Ukraine. The indicator of the number of the armed forces of Ukraine was considered as a guarantee of security of life in the country. The number of armed forces in Europe and Central Asia is compared. Some modern aspects of Ukraine's defense capability are considered. Road safety has also been analyzed as part of life safety in general. Road accident mortality in Ukraine and European and Central Asian countries is compared. The types of road accidents in Ukraine are given, as well as the main causes of road accidents.

Key words: *sustainable development, security of life component, armed forces personnel, mortality from road traffic injuries*

В аспекті сталого розвитку України в роботі проаналізований показник безпеки життя, як складова сталого розвитку. Проаналізована компонента безпеки життя в країнах Європи та Центральної Азії у порівнянні з Україною. Був розглянутий показник чисельності ЗСУ, як запорука безпеки життя в країні. Проведене порівняння чисельності збройних сил у країнах Європи та країнах Центральної Азії. Розглянуті деякі сучасні аспекти обороноздатності України. Також було проаналізовано безпеку дорожнього руху, як частину безпеки життя загалом. Порівняно

смертність у ДТП в Україні та країнах Європи і Центральної Азії. Наведені види ДТП в Україні, а також основні причини виникнення ДТП.

Ключові слова: *сталий розвиток, компонента безпеки життя, чисельність збройних сил, смертність від дорожньо-транспортної травми*

С точки зрения устойчивого развития Украины в статье анализируется составляющая безопасности жизни как составляющая устойчивого развития. Компонент безопасность жизни в Европе и Центральной Азии анализируется в сравнении с Украиной. Показатель численности ВСУ рассматривался как гарантия безопасности жизни в стране. Сравнивается численность вооруженных сил в Европе и Центральной Азии. Рассмотрены некоторые современные аспекты обороноспособности Украины. Безопасность дорожного движения также анализировалась как часть безопасности жизни в целом. Сравнивается смертность от ДТП в Украине и странах Европы и Центральной Азии. Приведены виды ДТП в Украине, а также основные причины ДТП.

Ключевые слова: *устойчивое развитие, компонента безопасности жизни, численность вооруженных сил, смертность от дорожно-транспортной травмы*

INTRODUCTION

Sustainable development of the country is a complex indicator that depends on many other factors. Usually sustainable development is divided into three global components. This is an environmental component that reflects the environmental situation in the country and environmental measures. The environmental component includes indicators such as public health, air and water quality, sanitation, climate change, renewable energy, biodiversity, forests, agriculture and more. The next component - economic development, it shows the current state of economic development of the country, this includes all economic indicators such as financial market development, macroeconomic environment, labor market efficiency and market of goods and services, infrastructure, rule of law, market openness and others. The third component - social, includes such indicators as public health and basic needs, education, the level of rights and freedoms in the country, the perception of corruption, social and institutional indicators such as the number of mobile subscribers and Internet users, transport infrastructure, number of airports and more. The social component also includes security - premeditated murder, political terror and more [1].

SECURITY OF LIFE COMPONENT

In general, the level of sustainable development of the country can be assessed by the component of quality of life, which considers all three components of sustainable development: social, economic and environmental [2]. However, security of life is also an important indicator of sustainable development along with quality of life. Life safety can be distinguished as another generalized indicator of development.

The security of life component is a comprehensive assessment that reflects the combined impact of various threats on the level of security and sustainable development of a country. To calculate the security of life component, generally accepted indicators of various international organizations are used, such as the UN, WHO, " Global Footprint Network ", "International Energy Agency", "Transparency International", "World Economic Forum", "World Resources Institute" and others.

Numerical value of the security of life component C_{sl} for the j-th country is defined as the norm of the Minkowski vector $\overrightarrow{S_i} = (s_i^j), s_i^j = 1 - t_i^j, i = \overline{1,n}$ [1]:

$$C_{sl} = \|\overrightarrow{S_i}\| = \left(\sum_{i=1}^{n} (s_i^j)^p\right)^{1/p},$$

where the parameter p=3.

The significance of the security of life component for Ukraine and other countries of the former socialist camp and the countries of the European Union is shown in Fig. 1 [3].

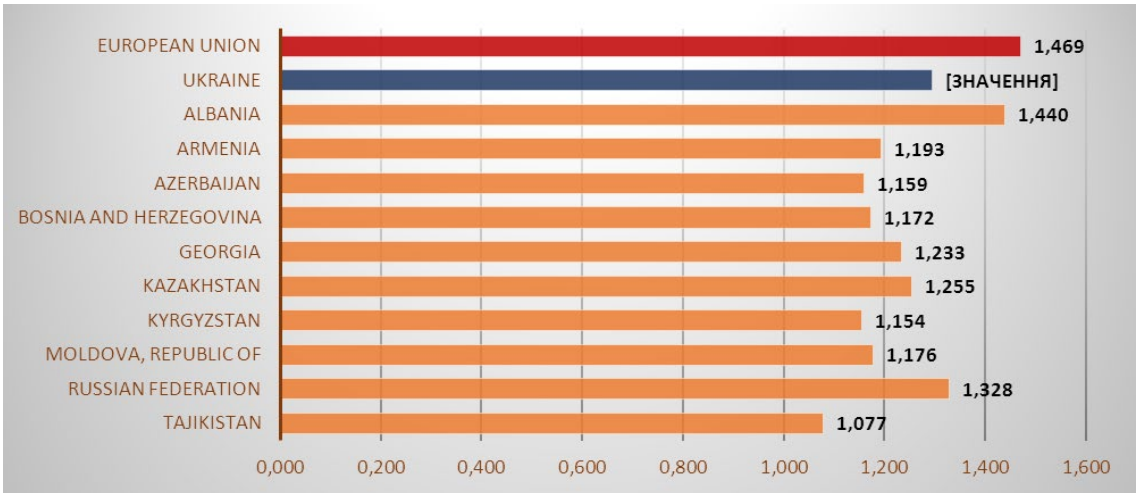

Figure 1. Security of Life Component (according to 2017 data)

Among the threats that are considered in the security of life component are the following [1]: violation of the balance between the biological capabilities of the planet and the needs of humanity in the biosphere in the context of changing the demographic structure of the world; global decline in energy security; global warming; growing inequality between people and countries; information gap; limited access to drinking water; nuclear proliferation; rising corruption; spread of global diseases; state instability; the intensity of the conflict; vulnerability to natural disasters.

As can be seen from the chart, the security of life in Ukraine lags behind the security in Albania and is slightly lower than in Russia. However, compared to the average value of the security of life component for the European Union, the lag is quite significant. Although if we consider the armed conflict in the east of the country, as well as the annexed Crimea by the Russian Federation, the security of life component for Ukraine is at an acceptable level.

ANALYSIS OF THE NUMBER OF ARMED FORCES

Another indicator that affects the security of life in the country is the number of personnel in the country's armed forces. This is a generally accepted indicator, and statistics on it are collected in World Bank reports [4].

As can be seen in the diagram, the critically low number of armed forces in Ukraine was on the eve of the Russian invasion. From this we can conclude that the invasion was being prepared from the middle of the country as well, by minimizing Ukraine's defense capabilities.

After 2014, significant changes took place in the Armed Forces of Ukraine. It was necessary to increase the country's defense capabilities at an accelerated pace in response to external aggression and the danger of further advance of the enemy into the country. The armed forces are gradually being rearmed, the army is receiving samples of modernized weapons, as well as samples of new modern weapons: unmanned tactical multi-purpose vehicle "Phantom"; new An-132 aircraft; BMP-1UMD with various combat modules such as "Squall" or "Stiletto". modernized tank T-72AMT with dynamic protection of the new generation – "Knife"; unmanned aerial vehicle complex "Gorlitsa" with a flight distance of more than 1000 km; BPAK-MP-1 "Spectator"; jet system of volley fire "Willow"; landing

assault boat "Centaur"; anti-ship missile system "Neptune"; new Ukrainian missile "Alder-M" and more.

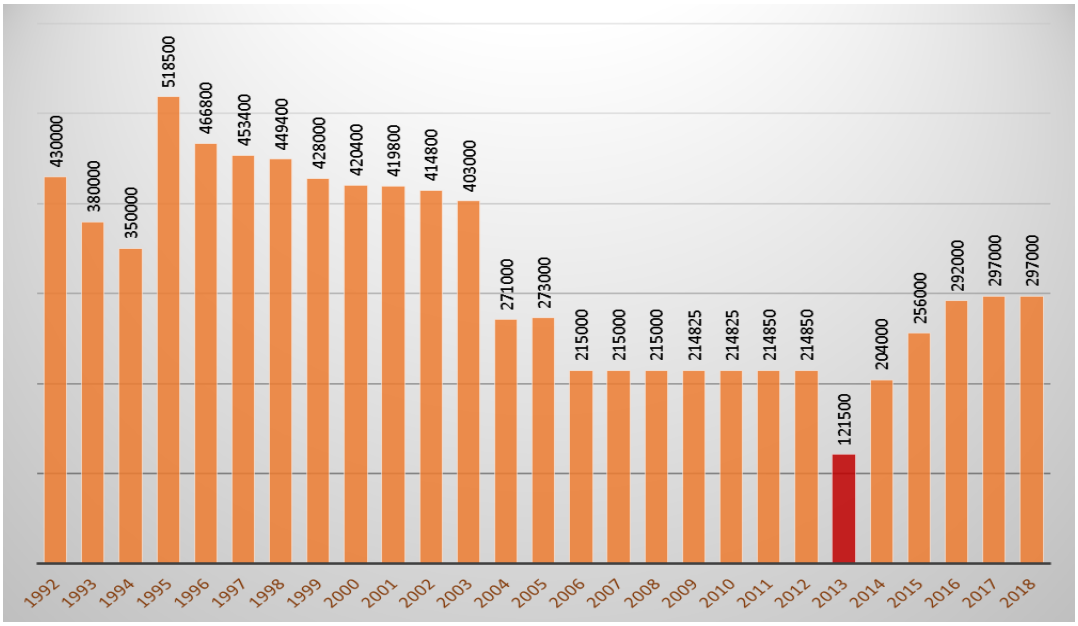

Figure 2. Armed forces personnel of Ukraine, total

In 2021, the Navy plans to receive three Island-class patrol boats from the United States. Unlike the previous ones, these vessels will be handed over immediately. The United States has approved the sale of state-of-the-art Mark VI combat boats to Ukraine. Weighing 72 tons, they are capable of speeds of up to eighty kilometers per hour. Ukraine will receive six boats free of charge, within the framework of the military assistance program.

Along with rearmament, the number of armed forces of Ukraine also increased (Fig. 3).

In Fig. 3 shows the first 20 countries with the largest armed forces among European countries and former Soviet republics. The list also includes Turkey as a NATO member and the Black Sea country. The chart shows that as of 2018, Ukraine ranks fifth in the total number of armed forces, second only to Russia, Turkey, Italy and France.

Ukraine's defense capabilities have increased significantly since 2013-2014, considering the increase in numbers, improving the quality of weapons, as well as the level of training, gaining extensive experience in combat operations. Today, the Ukrainian army is one of the most powerful armies in Europe. However, the current non-aligned status of the country should be considered. Most European countries are members of the NATO military bloc and can count on collective security. Due to this, the number of their armed forces may be insignificant. Some NATO countries have nuclear weapons on their territory, which further increases security. Ukraine voluntarily lost the status of a nuclear state, but instead, as we saw later, received nothing. In addition, until Ukraine joins NATO, its own security can only be ensured by its own armed forces. In our case, the increase in the number of armed forces is quite justified. In Fig. 4 shows the number of armed forces of the countries as a percentage of the total working population.

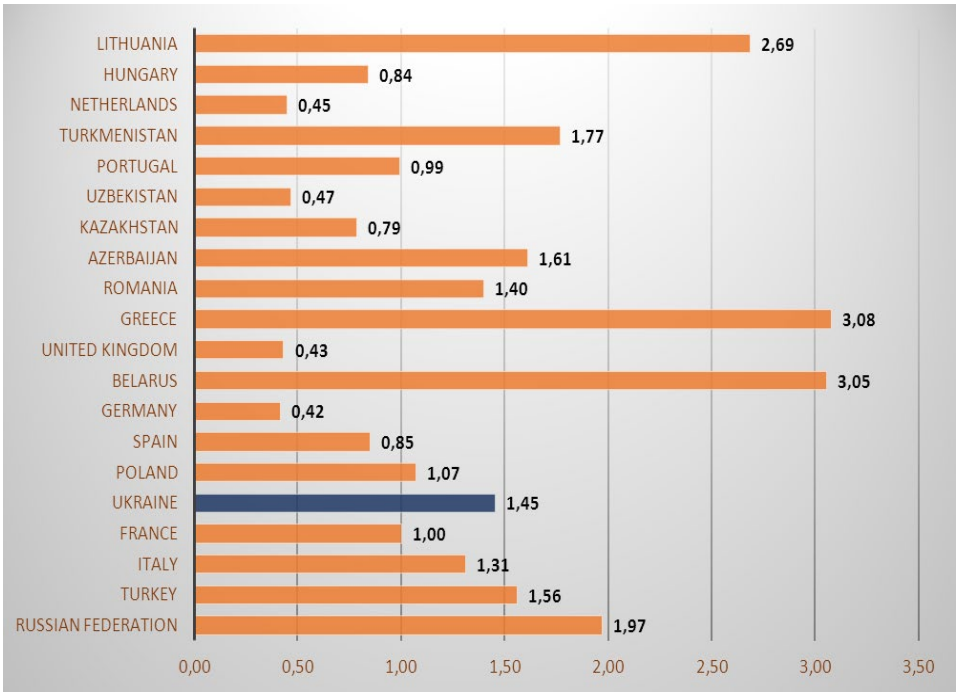

Figure 3. Armed forces personnel, total

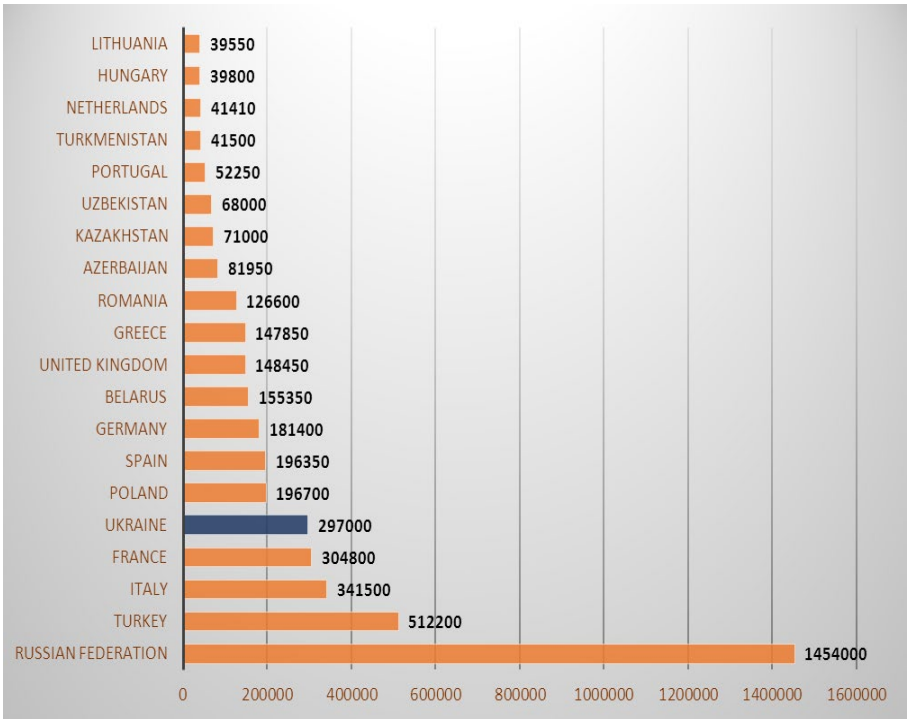

Figure 4. Armed forces personnel, % of total labor force

As can be seen from the diagram, a larger percentage of the armed forces of the total working population have countries at risk of armed conflict, such as Latvia and Greece, as well as semi-authoritarian countries such as Belarus, Russia and Turkmenistan.

The security of life in the country cannot be guaranteed in the context of an existing armed conflict or the threat of large-scale hostilities. In such circumstances, the key factor in the security of citizens is the power of the country's armed forces. Given the indicator of the security component of life for Ukraine, we can say that the armed forces of the state give a sense of security.

ANALYSIS OF MORTALITY FROM ROAD TRAFFIC INJURIES

Another indicator that reflects a certain aspect of safety is the number of people killed in road accidents in the country. The number of deaths in road accidents depends on many factors. But the state of transport infrastructure, the level of culture of drivers and compliance with traffic rules, the system of control over compliance with traffic rules and more have a significant impact on the number of accidents.

The following is a comparative diagram of the number of deaths from road accidents in European countries, the former Soviet republics and Turkey. In Fig. 5 shows the twenty countries with the highest number of deaths per 100,000 population.

The diagram shows that Ukraine ranks eighth in the list of countries. At the same time, a higher mortality rate than in Ukraine is observed only in the former Soviet republics and Bosnia and Herzegovina.

The main causes of accidents in Ukraine in 2019 are shown in Fig. 5 [5].

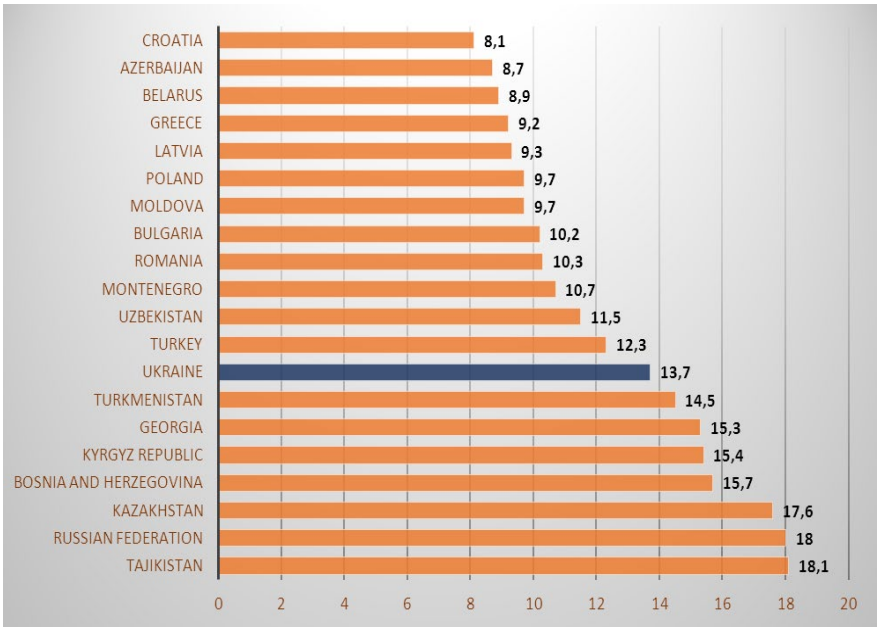

Figure 5. Mortality caused by road traffic injury (per 100,000 people), 2016

According to the First Deputy Head of the Patrol Police Department of Ukraine Oleksiy Biloshitsky [5], the number of road accidents in Ukraine in 2019 reached 160,675 cases. 26,052 of these accidents – with victims in which 3454 people died and 32736 – were injured. Friday and Saturday are the days when the highest number of car accidents with victims was registered (this is 31 % of all road accidents with fatalities and / or injuries).

The most common types of accidents: collisions (63 %), collision with a stationary vehicle (15 %), collision with an obstacle (12 %), which is 90 % of all accidents. A significant number of road accidents with victims were of the following types: collisions (41 %); collision with a pedestrian (33 %); hitting an obstacle (10 %).

Drunk driving and road accidents: 5189 road accidents in 2019 were registered due to drunk drivers; 1216 such road accidents with dead and / or injured persons, in which 106 people died and 1616 people were injured.

Given the statistics on road accidents, there is a fairly high risk on the roads in Ukraine. From the above causes of road accidents, it can be concluded that this is affected by the state of road infrastructure in Ukraine, non-compliance with traffic rules by drivers and a fairly high percentage of accidents due to drunk driving.

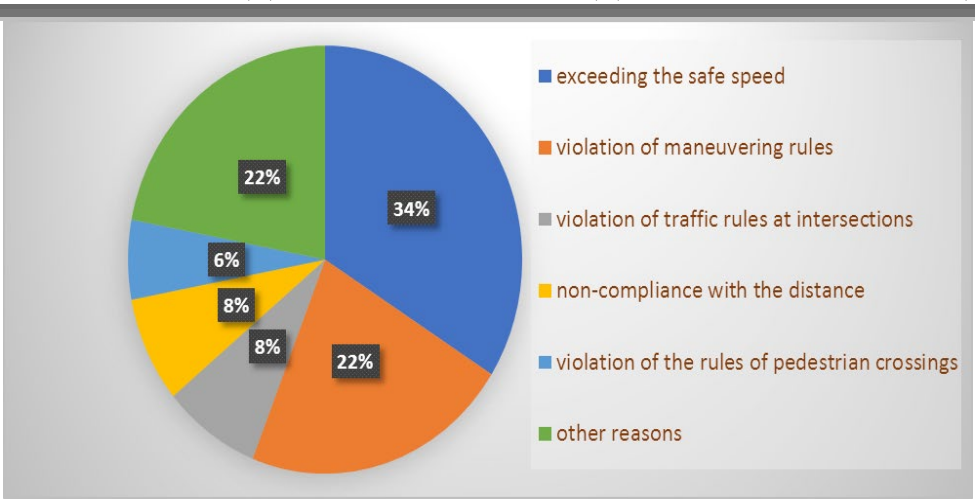

Figure 6. The main causes of road accidents in Ukraine in 2019

CONCLUSIONS

Quality of life and security of life in the country are very important indicators of sustainable development. The quality of life indicator combines almost all aspects of development. The quality of life is influenced by economic factors, environmental and the level of social development in the country. At the same time, the security of life indicator is also a very important indicator. Without a proper level of security, it is not possible to ensure a quality life. Therefore, we have considered some aspects that affect the safety of life in the country. Starting with such an indicator as a component of life security, which we compared for Ukraine and European countries and the countries of the former Soviet Union, we chose two more indicators.

First, we considered the country's security in terms of its level of defense capabilities, because in the context of external armed aggression, this is currently one of the main security indicators in Ukraine. From the point of view of the power of the modern armed forces of Ukraine, cautious positive conclusions can be drawn. The country's defense capabilities have been steadily strengthening in recent years. This is a logical consequence of armed aggression. However, the threat of further armed aggression against Ukraine persists. It is the ability to defend one's own land that is the general guarantee of security of life in Ukraine.

Another indicator we have paid attention to is the death rate in road accidents. Like previous figures, we equated mortality in Ukraine with similar rates in Europe and the former Soviet republics. According to this indicator, Ukraine ranks among the former Soviet republics, and lags far behind the level of road safety from other European countries and especially from European Union member states. We also considered the main types and causes of traffic accidents on the roads of Ukraine. Here we have something to work on and there is a reference point in the form of European countries.

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ИССЛЕДОВАНИЯ ОСАДКОВ ПОЛУЧЕННЫХ ПОСЛЕ УМЯГЧЕНИЯ ВОДЫ

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RESEARCH OF THE PRECIPITATION OBTAINED AS A RESULT OF WATER SOFTENING

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Рассмотрены возможности утилизации осадков полученных после умягчения реки Квирила предложенным раствор-осадителем. Строительный раствор полученный из осадка и цемента в 1.47 раз легче цементно-песочного раствора. Использование осадка в строительных растворах экономически и экологически оправдано.

ВВЕДЕНИЕ

Одним из важных аспектов охраны окружающей среды является обработка и утилизация осадков образующихся при обработке природных вод. Вопросы переработки и утилизации осадка каждой водоподготовительной станции решается в зависимости от его химического состава и физико-химических свойств.

Разработанный метод умягчения реки Квирила путем введения в воду раствор-реагента также требует рассмотрения этого вопроса.

ЦЕЛЬ РАБОТЫ

Исследование бетона приготовленного с использованием осадка полученного при обработке воды реки Квирила.

ОСНОВНАЯ ЧАСТЬ

В качестве реагента использовался водный раствор трехзамещенного фосфорнокислого натрия Na_3PO_4 с натрием сернокислым Na_2SO_4 или натрием сернокислым кислым $NaHSO_4$, или дифениламином $(C_6H_5)_2NH$ и гипса. Раствор-