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Ways to develop the gold mining industry in Uzbekistan

Monograph

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M.O. Kosimov. Ways to develop the gold mining industry in Uzbekistan. National Technological Research University "MISiS" branch in Almalyk city.

In the monograph, the role of this industry in the system of economic reforms implemented in our country, its history, stages of development and ways to increase its efficiency are considered. At the same time, in the national economy, the generalization of experience and achievements related to this field, the rejection of some unjustified factors, the introduction of economic mechanisms in this field that can be adapted to the needs of the market are gaining great importance and becoming a necessity of life.

In bringing this book to the attention of a wide range of readers, on the part of the author, the Laws of the Republic of Uzbekistan, Presidential Decrees, decisions of the Cabinet of Ministers, the Ministry of Mining and Geology, the Almalik Mining and Metallurgical Combine (AMMC) and the Navoi Mining and Metallurgical Combine (NMMC), as well as data from the International Gold Consulate and the London Metal Exchange were widely used.

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Contents

INTRODUCTION

Gold is a metal discovered by mankind at least 6500 years ago. The oldest treasure is believed to be found in the Varna Necropolis in Bulgaria, and the items found there date back to 4600 BC. Gold has played an important role in the course of human evolution and historical development, and it is still used as a reliable investment. Different currencies have come and gone, but it has remained a universal and stable standard for thousands of years. Ownership of this metal has always historically been characteristic of the economic and political system of the majority countries, and gold has become not only wealth, but also a criterion for assessing the economic status and power of a particular state in society. It has been like this until now.

The role and place of this metal in the development of mankind is incomparable due to the fact that it is the cause of wars in places rich in gold, in the intersection of economic interests, in most cases. Based on it, the monetary system began to form, cultural values and architectural masterpieces were created, which are priceless and still amaze everyone . Due to the desire to produce this metal, many chemical elements were discovered by scientists on the globe, and the excitement of gold mining helped to develop new prospective mines in different areas of the globe. It is known that gold plays an important role in the economy of every country and is one of the main sources of constant foreign exchange earnings. This area is also one of the key areas in the implementation of strategic goals . Therefore, the issues of development of the gold industry have been in the constant attention of countries and relevant economic systems.

In the system of economic reforms implemented in our country, the efficiency of this sector and issues of its management are gaining more and more importance. In this period, in order to rationally solve economic problems, it is becoming a vital necessity to generalize the achieved experience and achievements, to abandon some unjustified types of management, and to be able to adapt to the needs of the market . This necessity is fully applicable to non-ferrous metals, especially gold mining industry in Uzbekistan .

As the first President of the Republic of Uzbekistan, IAKarimov, noted: "...it is strategic for us to implement structural changes in the economy with specific goals in mind. In this regard, we must conduct a clear structural policy. First of all, this policy should be aimed at further strengthening the economic power of the country, full and effective use of our rich natural, raw material and labor resources, intellectual and scientific-technical potential» [1] .

At the present time, the non-ferrous metal mining industry in Uzbekistan is entering the path of rapid development. This development acts as one of the main factors leading to the improvement of the national economy through the rational use of the country's vast natural resources.

President of the Republic of Uzbekistan Sh.M. Mirziyoyev's Resolution No. PQ-4124 dated January 17, 2019, is important such as " creating additional conditions for attracting investments for further development and liberalization of the economy, modernization of production, and increasing the competitiveness of large enterprises in the mining and metallurgical industry... " defined tasks [2].

The characteristics of the development of the world economy in the current period require to consider the problems of the republic's gold industry in a holistic (complex) way and to solve them with convenient (optimal) ways and methods. The launch of new production facilities ensures an increase in gold production at mining and processing enterprises. At the same time, due to the increase in the depth of the deposits in the underground gold mining enterprises, the rate of growth of product production is observed to slow down. Despite the increase in the volume of processing of ores, it also occurs due to the decrease in the content of useful components in ores. In some gold mining areas, the content of ores is much lower than the planned indicators. It is confirmed in practice. Such cases are in the underground method gold mining enterprises have a negative impact on labor productivity and product costs.

The geological structure, mineralogical composition and technological characteristics of the ores and related rocks of gold deposits in the territory of our republic have not yet been fully studied. In the gold mining industry, like other

sectors of the national economy, intellectual potential, intellectual capital (capital), and the human factor are in the main place.

It should be noted that the gold mining industry has been a localized industry for many years, and the administrative-command system dominated all aspects of management. The shortcomings, problems and ways to eliminate this industry, which operated far from the eyes of society, in most cases did not go beyond the walls of decision-making offices.

In the conditions of national independence and market economy, it has become a requirement of today to completely update the ideology of management, to eliminate the old traditions, to form a thorough management system that conforms to world standards and operates freely and promptly in the economic environment based on the principles of independence. IAKarimov, the first President of the Republic of Uzbekistan, admitted that "Uzbekistan has no future without a developed export capacity" [3].

The role of gold and other non-ferrous metals in the export potential of our republic is increasing year by year. For example, 687 tons of Uzbek gold were exported to the world market in the last ten years, 2010-2020. In 2022, 100 tons of gold will be exported, bringing 5.8 billion dollars to the state treasury, and gold exports in 2023 will exceed 8.1 billion dollars - this is the total exported goods and services of the Republic. and made up about 40% of the products.

It should be said that the penetration of our country's enterprises into world markets, the efficiency of their export-oriented activities, and the study of factors such as the economic, social and market situation affecting it are also urgent issues. To increase labor productivity in enterprises specializing in open and underground gold mining and processing in our country, to organize the management system based on the requirements of the market economy, to study the features of self-management, financial relations, and the application of antimonopoly laws in this area is one of the main tasks of today.

Issues such as the use of new technologies in the gold mining industry, the creation of modern infrastructures relevant to the industry, and, at the same time,

providing gold mining enterprises with highly qualified personnel ensure the successful development of the industry and the growth of the national economy. is among the factors.

In bringing this monograph to the attention of the readers, the author took into account the Laws of the Republic of Uzbekistan, Presidential Decrees, Cabinet of Ministers decisions, as well as Xalgapo Currency Fund, London Metal Exchange, Ministry of Mining and Geology, Almalyk Mining and Metallurgical Combine (AMMC) and Navoi mine - metallurgical combine (NMMC) data were used.

In covering the topic, the ideas, scientific and practical recommendations put forward by the first President of our country, IAKarimov, on the development of the basic sectors of the economy, the stimulation and activation of the attraction of foreign investments to our country, and the increase in the volume of export-oriented products, as well as the foreign and the researches of the scientists of our republic served as an important basis and guide.

Dear reader! The authors welcome critical and suggestive comments on this monograph from readers and major experts in the field and will consider it in future reprints.

CHAPTER 1 . IN THE WORLD GOLD EXCAVATION GET IT TODAY DAILY STATUS

1.1. History and stages of development of gold mining in the world

Egypt, Spain, the Caucasus, India, Central Asia, China, Central and South America are among the countries that have mined gold since ancient times. The remains of gold mines dating back to 3000 BC have been found here.

In those days, very simple methods were used in gold mining, the rocks were heated by fire, and after they were broken up, large pieces were crushed on millstones and washed in water.

Gold, considered a means of economic transactions, acted as one of the factors that ensure the independence of existing countries in the world, their power and protection from instability. The essence of gold as a socio-economic phenomenon is required to be studied based on the analysis of rich scientific approaches collected in economic theory.

Summarizing the theories that arose in the Western economy in the XVI-XVIII centuries about the nature of gold, they can be classified as follows:

- The exponents of the theory of metallicity, W.Stefford, T.Men, D.Nors (England), A.Moncretien (France) and F.Gilini (Italy) recognized gold as a source of society's wealth and asked which society has the most gold and silver reserves. those who put forward the opinion that that society is considered rich, and they did not want to recognize paper money;
- The major exponents of the theory of nominality are J. Berkley, J. Stewart, N. Barboni (England) and the German economist G. Knad. those who assumed the loss of a certain part and came to the conclusion that the main decisive factor is not the metal content of money, but their nominal value.

They did not deny paper money either, but they considered money to be a conventional symbol issued by states and represent units of account and could not explain why it was valuable.

Proponents of classicism and quantification (J.Boden, SH.Montesquiel, D.Hume, J.Mille, I.Fisher) also interpreted that gold is a special commodity and that, unlike other commodities, it is distinguished by its own characteristics, and who considered it essential to establish the connection between the flow of precious metals and the rate of growth of the price in the basis of their theory.

In particular, Fisher said that goods do not have their true value until they enter the market. It has its value based on the amount of money supply in the market, that is, it comes to the conclusion that the money supply in circulation determines the price of goods [4] .

Figure 1.1. The gold standard (400 troy/ounce))

Therefore, gold has a special commodity position, it does not rot, does not rust, does not lose its quality regardless of the passage of time, unlike other metals , it almost does not react chemically with other diluting and reducing solvents. and acts as a universally accepted equivalent representing the value of all other goods.

It is necessary to highlight two main characteristics of gold, like other goods: firstly, it has its own value as a separate commodity, like other goods, and secondly, it also has utility, that is, consumption value. Its consumption value is

total It is characterized by the fact that it can be exchanged for any other (material, material, etc.) goods as a recognized equivalent.

Today, the increase in the number of people on the globe and the progress of the existing countries in it shows the tendency of the need for the use of metals in human life to increase more and more. The limitlessness of needs and such demand for metals leads to the depletion of available underground mineral reserves in practice, which in turn proves in practice that resources are finite.

The mining companies of the developed countries of the world are currently conducting geological exploration for non-ferrous minerals, which are in great demand in the world markets. Extraction of a mineral raw material after prospecting creates the need to extract this raw material by cost-effective methods.

mobilizing such mines for mining practically proves that the prospecting work was carried out in accordance with the purpose. World-class mines are represented in table 1.1 below.

World class mines

1.1 - table

No	Useful tips	The name of the mines	States name
1.	Copper	Chukikamata Udokan	Chile Russia
2.	Gold	Muruntov Bitwatersrand	Uzbekistan JAR
3.	Nickel	Sanburi Norilsk	Canada Russia
4.	Zinc	Mount Isa Sullivan	Australia Canada
5.	Diamond	Udachnyi Djuaneg	Russia Botswana

1.2. Ranking of major gold mining countries in the world

In the last century, the leadership in gold mining fell to the Republic of South Africa, and for several years now, the only country that has been leading the way in gold mining is **China.** is considered

In 2020, 368.3 tons of gold were mined in China - this is 11% of the total gold produced in the world. But this figure is actually an alarming figure for China, the main reason for which is the lowest figure of gold mined in the last 9 years and in 2016.

Gold production in China decreased by 10% by the end of 2021 and amounted to 328.98 tons. In addition, 114.58 tons of gold was obtained from imported raw materials . So, the total production of domestic and imported products was 443.56 tons.

Russia takes the second place in the rating. In comparison to the Chinese state, this country has been regularly increasing its production indicators from year to year . In 2018, gold production in Russia reached 295.4 tons, in 2019 - 329.5 tons, and in 2020 - 331.1 tons.

by Australia , which is the main competitor of Russia . This country is also increasing the volume of metal production every year. In 2018 , in Australia - 317 tons, in 2019 - year 325.1 tons, and in 2020 - 327.8 tons of gold were produced. It should be noted that for many years Russia was lagging behind Australia. Only in 2019, due to the new gold mines launched in the Irkutsk region, the production volume was increased, and only in 2019 was it possible to overtake the country of Australia and rise one step. It should be noted that gold mining is carried out differently in developed and developing countries (see Table 1.2).

Compared to 2019, countries such as **the USA and Canada, which are major producers** , remained in their positions, which is why they keep the 4th and 5th place in this ranking.

The Republic of South Africa (JAR) had to leave the top ten gold mining rankings . As we mentioned earlier, this country led the ranking of gold producers,

and in 1970 it went down in history as the only country that produced 1000 tons of gold. But in 2020, South Africa left the top ten as a result of declining production over the years.

Ghana is the only country in the top ten gold producers from the African continent **country**, it produced 138.7 tons of gold in 2020.

Peru also had to leave the top ten . He had to give way to our **beloved Uzbekistan.** Our country produced more than 100 tons of gold in 2020.

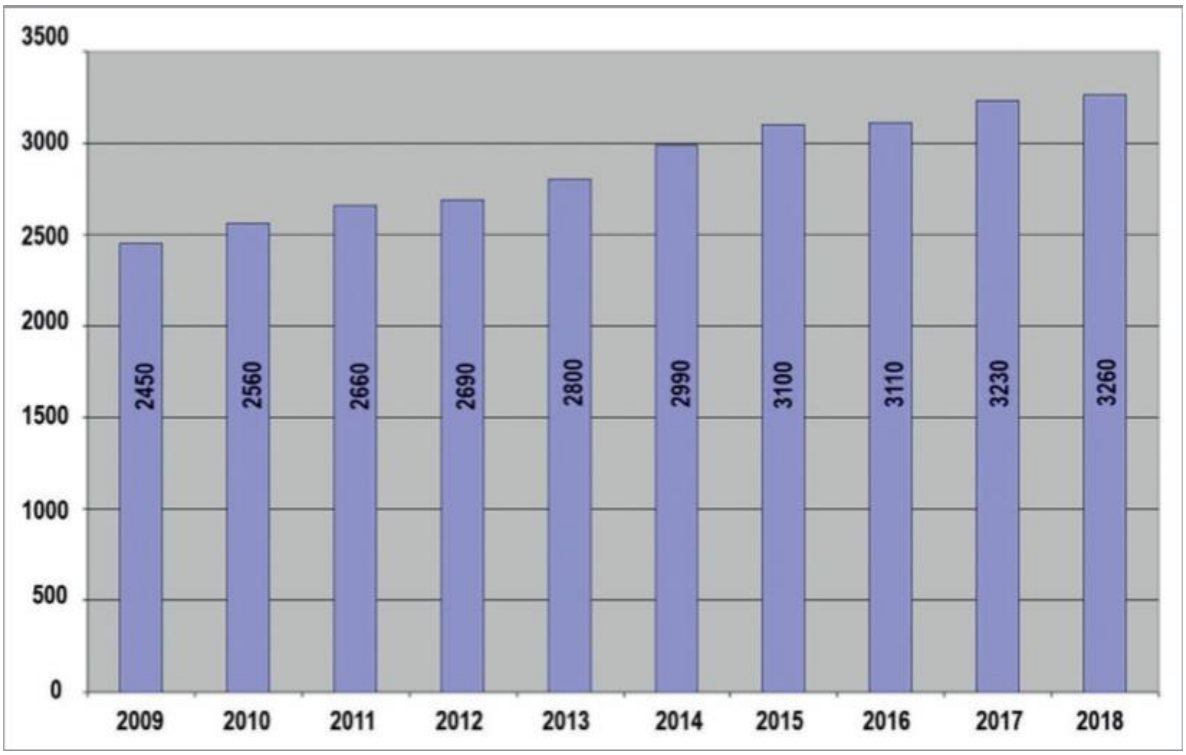
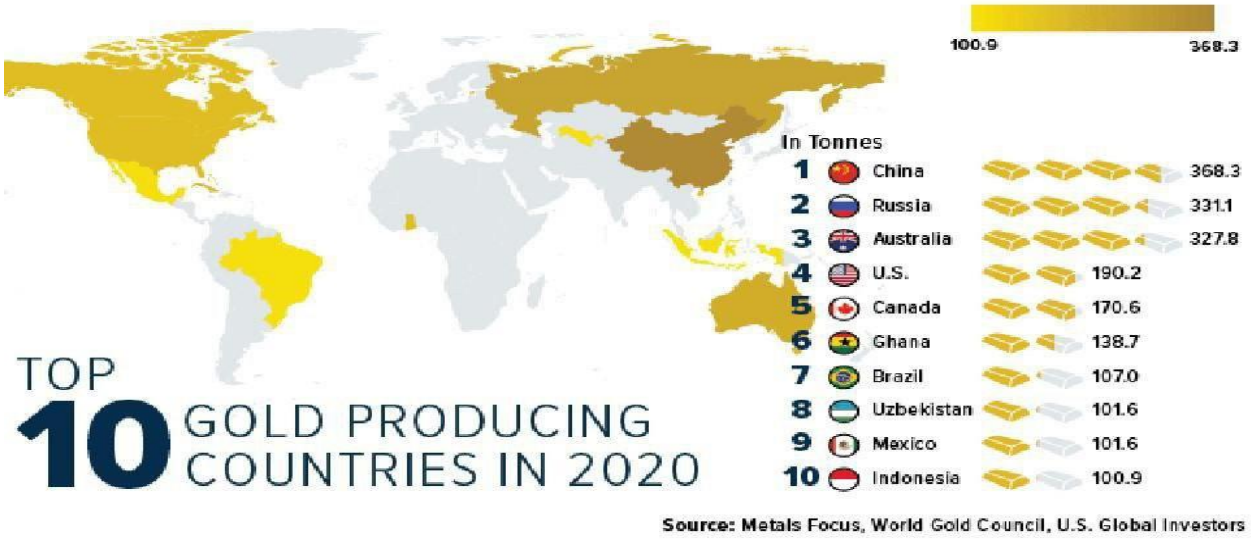


Figure 1.2. Breakdown of gold production by year 2018 - gold produced interstate. Source: (US Geological Survey)

In addition, a gentle upward movement along the rating can be observed in the example of the country of **Brazil** , which in 2020 - the country's gold production reached 107 tons. In recent years, new selective smelting technologies for beneficiation of low-grade ores have been introduced in the US for gold processing.



Argentina, Bolivia, Chile, Colombia, Mali, Morocco, Papua, the Philippines, Tanzania and other countries also made 30% of the total gold produced in the world in 2018 due to a significant increase in gold production.

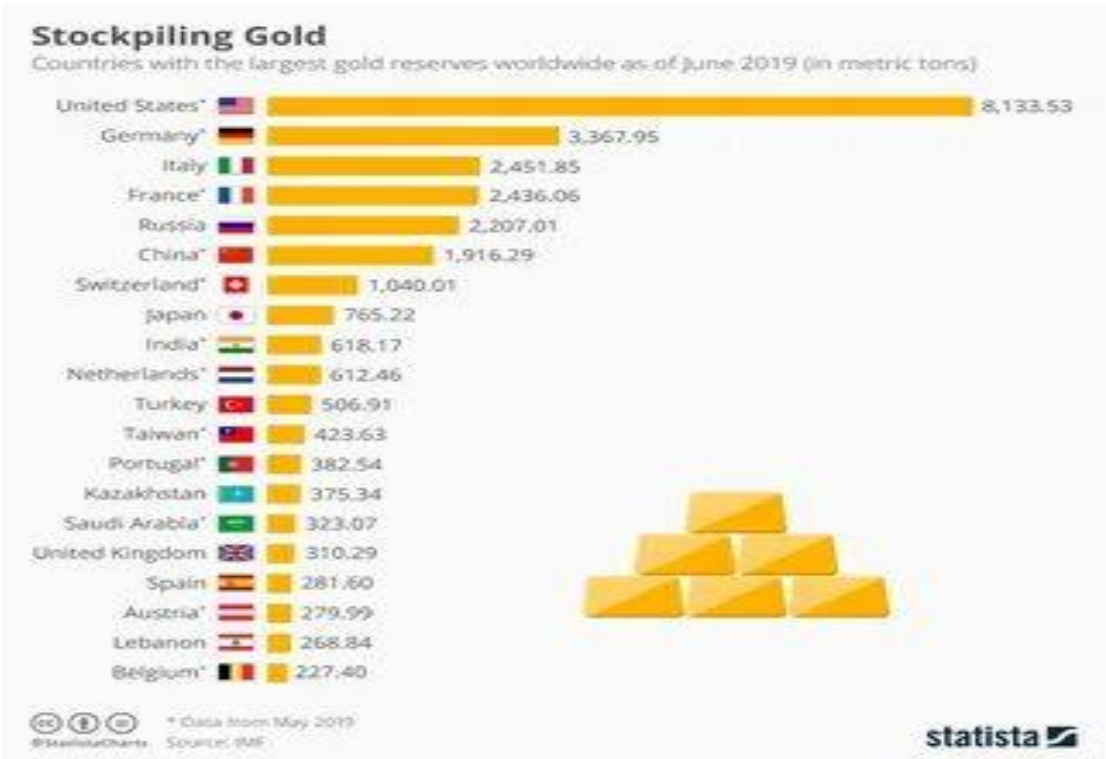


Figure 1.3. Large gold mining countries in the world.

Nothing that gold production is actually under the strict regulation of most countries in the world, and serves not only as an effective tool of economic policy, but also as a directly important weapon in its implementation.

Although gold lost its former importance as a means of accumulating wealth and as a hedge against inflation and instability in the latter years of the 20th century,

gold retained its dual status as a reserve financial asset and a precious commodity. is an important part of the metals market.

The base of the precious metals market is the gold market. Organizationally, the gold market consists of a consortium of several banks that have the authority to deal with gold. They record the average market rate of gold twice a day.

There are more than 50 gold markets in the world, of which 11 are located in Europe, 19 in Asia, 14 in America and 8 in Africa.

Trading in gold markets is carried out according to precious metals in large and small bars (see Table 1.3).

1.3 . Castings widely used in the world [5] .

Castings	weight, in grams	Weight, in troy ounces (1oz≈31.1g)	The use of castings
100 gr	-	3.2151	Internationally
1 ounce	31,1035	-	European countries, including Australia, also in Uzbekistan
10 fibers	116,638	3.75	India, Pakistan, Singapore
5 taylor	187,145	6,017	Hong Kong, Taiwan countries
10 happiness	152.44	4,901	The country of Thailand
5 chi	18,750	0.603	The country of Vietnam

If we look at the gold mining process of the countries that were leaders in gold mining in the last century:

1. In the last years of the 20th century, the Republic of South Africa (SA) went down in history as a country that was a leader in gold reserves and mining. One of the main reasons for this is the opening of the "Main-Rif" gold mine in 1886 . As a result of the development of the "Main-Rif" gold mine, the Republic of Kazakhstan became the first in the world in the field of gold production.

In the years 1884 - 1893, when the gold rush (zolotaya likhoradka) began, the average annual gold mining in the Republic of Kazakhstan was 13 tons. However, by 1920, South Africa produced half of the world's gold. The highest rate was recorded in 1970. In the same year, JAR managed to extract 1000 tons of gold. During the following years, this indicator continued to decrease and fell to 30% in 7 years [6] .

This country, which is a leader in gold production and has large reserves of deposits (1976 - 73.9%), has been reducing mining operations due to the rapid rise in the price of the metal. Currently, the economic indicators of some mines are deteriorating due to their increasing depth (4000-5000m). These include the collapse of welds, underground fires, and the cost of excavation . Despite this , South Africa is one of the top fifteen gold mining countries in the world.

Canada is the second largest producer of gold after China , Russia, Australia, and the United States. The main gold deposit of this country is located in the province of Ontario. In 1976, the Canadian government opened the "Gold Institute" under the gold-producing companies. This institute is funded by gold mining companies. The institute studies gold production processes in the USA, Australia, Argentina, Chile and other countries. The United States has been the world's largest gold producer for 50 years . In 1905, it fell to the second place, giving way to the Republic of Kazakhstan. In 1915, gold mining in the USA was 140 tons, but this amount decreased to around 57 tons in 1920 [7].

The main part of the gold is produced by the Homestake and Carlin mines (see table 1.4).

Leading gold mining countries in the world 1.4 - table.

No	**States**	**1997 in tons**		**2000 in tons**		**2001 in tons**		**2001 1997** %
				ABS	%	**ABS**	%	
Total gold mined including;		3707	100.0	3745	100.0	3483	100.0	93.9
1.	**JAR**	489.2	13.2	428	11.4	399	11.4	80.1
2,	**USA**	351.4	9.4	355	9.4	335	9.6	95.3
3.	**Australia**	311.4	8.4	296	7.9	291	8.3	93.4
4.	**Canada**	168.5	4.5	155	4.1	159	4.5	94.3
5.	**Russia**	137	3.7	155	4.1	168	4.8	122.6
6.	**China**	156.8	4.2	162	4.3	165	4.7	105.2
7.	**Indonesia**	101.4	2.7	139	3.7	175	5.0	172.5
8.	**Peru**	74.8	2.0	133	3.5	133	3.8	177.8
9.	**Uzbekistan**	81.7	2.2	88	2.3	86	2.4	105.2

The table is based on information from the "Voice of Uzbekistan" newspaper, No. 75, June 15, 2002.

The gold mining industry in Australia has been in a state of stagnation for a long time. In the 1970s, as many mines were unprofitable, the government exempted the gold mining industry from profit tax and subsidized it . Later, when the price of gold rose and their profits increased, the state canceled these benefits.

It can be noted that gold mining in Russia and Uzbekistan is becoming more active year by year.

The concept of the price of gold became clear only after the abolition of gold monometallism. During a long period (1934-1968), the price of gold was continuously recorded, and 1 troy ounce was 35 dollars.

From January 1, 1976, the fixed world price of gold was abolished by the International Monetary Fund. In this process, which is called demonetization of gold, its use as a medium of exchange and payment for international transactions has become more complicated.

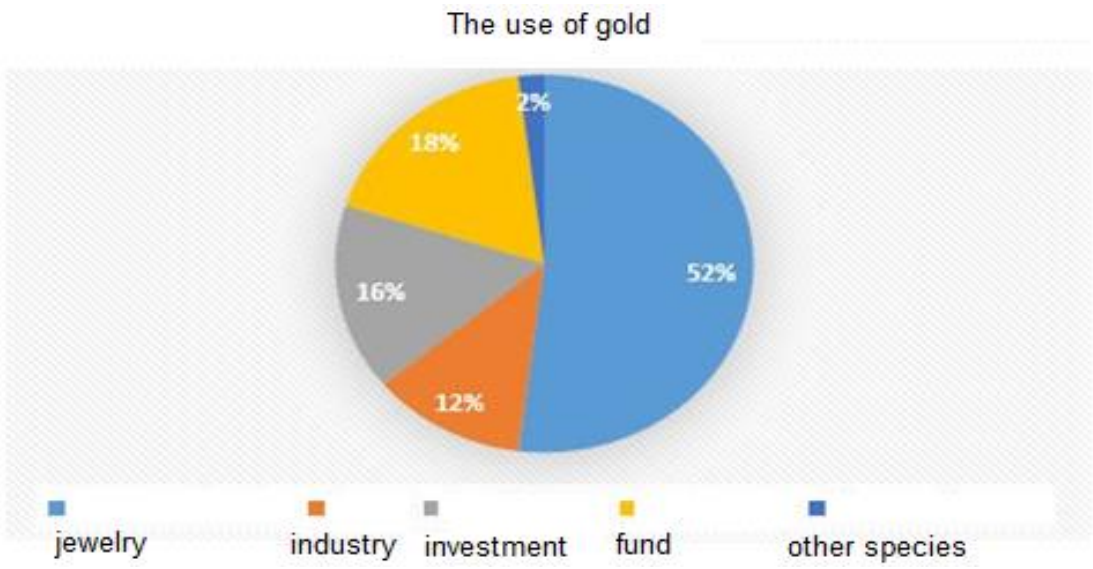
However, in January 1980, under the influence of various economic and political events, 1 troy ounce of gold became equal to 850 US dollars. The sudden increase in the price of gold in 1980 was based on the following reasons:

- weakening of state intervention in gold markets,
- oil crisis,
- Cyclical decline of the US economy,
- War in the Middle East,
- the first serious speculations on stock exchanges, etc

By the 1990s, the price of gold in the world markets left the above situation, which is explained by the fact that the attention of active investors to the gold market decreased a little in these years, due to the expectation of its reform. In early 1996, gold prices reached 418 dollars. By 1999 , it had dropped to $260 per troy ounce. Thus, in the first half of February 1996, the price of gold reached $417, which remained the highest price.

Figure 1.4 Gold price dynamics in world markets.

It is appropriate to distinguish 4 main areas where gold is used: jewelry production; industry, medicine and research; reserves of money - credit institutions. More than three-quarters of gold bullion processed worldwide is in developed countries.



According to this tradition, making jewelry from gold bars is of particular importance. In 10 years, the share of jewelry industry in gold consumption increased from 55% to 85%: in 1987 - 1334 tons, and in 1997 - 3328 tons. Although this component has practically always occupied a large weight in the structure of demand, the growth of prosperity in the world has led to an increase in the amount of jewelry. In 2021, economic growth indicators in India and China increased the demand for washable products, and the production volume of gold jewelry reached 2,221 thousand tons.

The demand for gold in the world reached 1,147 thousand tons in the IV quarter of 2021, according to the World Gold Council (WGC), this indicator increased by one and a half times compared to the IV quarter of 2020. In general, after the COVID-19 coronovirus, according to the 2021 report, the world demand for gold was 4,021 thousand tons, an increase of 10% compared to 2020 [8].

The use of gold in China increased by 37% in 2021 and reached 1,120.9 tons compared to 2020, according to the China Gold Association (CGA). This figure was only 12% in 2019 before the pandemic.

In particular, in 2020, the demand for gold by jewelers increased by one and a half times and amounted to 711.29 tons, investment demand for bars and coins increased by 27% and reached 312.86 tons.

In the 1980s, the development of financial leverage created a third form of global gold supply - forward contracts, which have become an important element of it in recent years (see Table 1.5).

Gold ***forwards, futures, and options*** contracts allow gold mining companies to bid on gold that has not yet been mined, thereby hedging future production against unfavorable price conditions.

1998 Results of the World's Leading Gold Mining Companies , (troy ounces)

1.5 – table.

No	Companies	Contract price	Mining cost	Benefit
1	Della Gold	403	174	229
2	Bairick Gold	420	196	224
3	Normandy	474	259	215
4	Aurora Gold	416	201	215
5	Great Central	452	241	211
6	Sons of Gwalia	513	311	202
7	Camblr	452	260	192
8	Ashanti	450	261	189
9	Pegasus	460	274	186
10	TVX Gold	419	237	182

The table was compiled based on www.gold.org internet data.

Currently, the gold mining companies represented in Table 1.5 focus on futures contracts. For example, in 2000, the Canadian company "Barrie Gold" made futures contracts at 400 - 420 US dollars, but the average cost of gold mining

was 227 dollars. It should be noted that in recent years, gold mining in the world has been in the hands of highly efficient companies (see table 1.6).

Table 1.6.

Name of companies		States	Mining, t.		2000 1999, %
			1999	2000	
1	Anglo Gold	JAR	215	225.3	104
2	Newmont Mining	USA	130	152.3	117
3	Gold Fields	JAR	119	117.9	99
4	Barrick Gold	Canada	114	116.5	102
5	Placer Dome	Canada	96	92.7	96
6	Rio Tinto	Great Britain	94	85.0	90
7	Homestake Mining	USA	75	72.5	96
8	Harmony	JAR	40	66.8	167
9	Normandy Mining	Australia	59	64.5	109
10	McMoRan C&G	USA	67	67.9	101

The table was compiled based on data from the Internet http: www.gold institute.org 2000.

1.3 . Leading gold mining companies in the world

to keep the cost of the produced products at a low level . In 1998, the company's costs for 1 troy ounce of gold were $179, down from $34 in 1997, and in 1999, this figure decreased by 26% to $134.

Similarly, the Canadian company "Golden Knight Resources" is engaged in gold mining in Ghana, "Orezone Resources and Sahelian Goldfields" in Burkina Faso, "Semafo Gold" in Guinea, "Sutton Resources" in Tanzania and "1AM Gold" in Mali.

Australian "Gold Mining" company conducts gold mining on the island of Sardonyya, and "Delta Gold" company on the island of Papua and Zimbabwe. It should be noted that the price of 1 troy ounce of gold produced by "Delta Gold" in Zimbabwe was 130 dollars. All companies in table 1.6 are expanding cooperation with all countries of the world.

the CIS countries , the companies "Placer Dome", "Cyprus Atax", "High River Gold", "Western Pinacel Mining" in Russia, " Sameko", "Palas Mining Company" in Kyrgyzstan, "Eurasia Gold" Corporation in Kazakhstan, In Tajikistan, the Commonwealth and British Minerals Corporation, and in our

Republic, the companies "Newmont Gold", "Oxus Mining R1s" conducted their activities.

Anglo Gold, the world's largest gold miner, merged with Minorco and conducted gold mining operations in Argentina, Brazil, Mali and Namibia. "Anglo Gold" company acquired its place on the Australian stock exchange along with the acquisition of the Australian company "Acacia Resources". In 2000, the company bought 25% of the shares of the jewelry company "Ogo Africa" in South Africa for 55 million dollars.

In June 2000, the Australian "Gold Fields" company merged with the Canadian "Franco-Nevada Mining" corporation. As a result, the company "Gold Fields international" was created, besides, the company acquired the right to participate in the stock exchanges of New York, Johannesburg, Paris, Brussels and Switzerland. This company is currently the third largest gold mining company in the world and the second largest in terms of gold reserves, and most of its mining operations are in South Africa.

Figure 1.5. The dynamics of gold mining in the world over the years

Thus, considering the activities of major gold mining companies in the world, we can note the following conclusions:

- Gold mining occupies an important place in the world economy, and the problems of its development are related to the fierce competition in the world market, and the price situation of gold has a variable nature accordingly;

Figure 1.6. Demand and supply of gold in the world

- Since 1997, in the world experience, in order to reduce the costs of establishing new enterprises, there is a trend of mergers of existing firms and enterprises, and in addition to the effective conduct of gold mining by them in various regions of the world, they also reduce the amount of costs spent on the production of finished products and 1 troy ounce of gold. they are operating in the field of competition to ensure the maximum level of profit;

- The expansion of inter-firm relations has led to the emergence of a new type of management that manages production on a large scale, and such management leads to the rise of technologies, the reduction of production costs, the improvement of working conditions, the growth of professional skills, the expansion of markets due to effective globalization and the protection of the environment and other showed its positive effect on several factors;

The experiences of Anglo Gold, Barrick Gold, and Gold Fields companies in the world show that the majority of gold investments are made in Chile, Argentina,

Brazil, Indonesia, Ghana, Tanzania, which have sea and ocean ports. It is being implemented in countries like Congo, Mali, Papua Guinea, etc.

Central banks have been net buyers of gold over the past 12 years, accumulating 463 tons of gold in their reserves, an increase of 82% compared to 2020.

Inflation caused by the pandemic and economic uncertainty of indefinite duration - gold has begun to pass as a hedge to some extent for investors (WGC). This, in turn, led to a 31% increase in demand for gold bars and coins to 1,18,000 tonnes, the highest figure in eight years.

Gold mining and distribution until 2030

price prediction

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gold USD/Troy	1393.0	1,771.2	1780.0	1,700.0	1650.0	1620.0	1610.0	1600.0	1590.0	1590.0	1580.0	1580.0
Average price of gold, % g/t	9.8	27.2	0.5	-4.5	-2.9	-1.8	-0.6	-0.6	-0.6	0.0	-0.6	0.0
Gold mining in the world is in millions	104.0	103.5	109.4	112.9	117.7	120.5	124.6	128.2	130.5	133.6	137.2	141.7
Gold mining volume in the world, % g/t	-2.0	-0.5	5.7	3.2	4.3	2.4	3.4	2.9	1.8	2.4	2.7	3.3

Source: Fitch Solutions, September 7, 2021

Figure 1.7. Gold mining price prediction in the world

The demand for gold in production and industry increased by -15% compared to 2020 and reached 96.75 tons. Another major demand in the industry is related to China's new energy electronic sector.

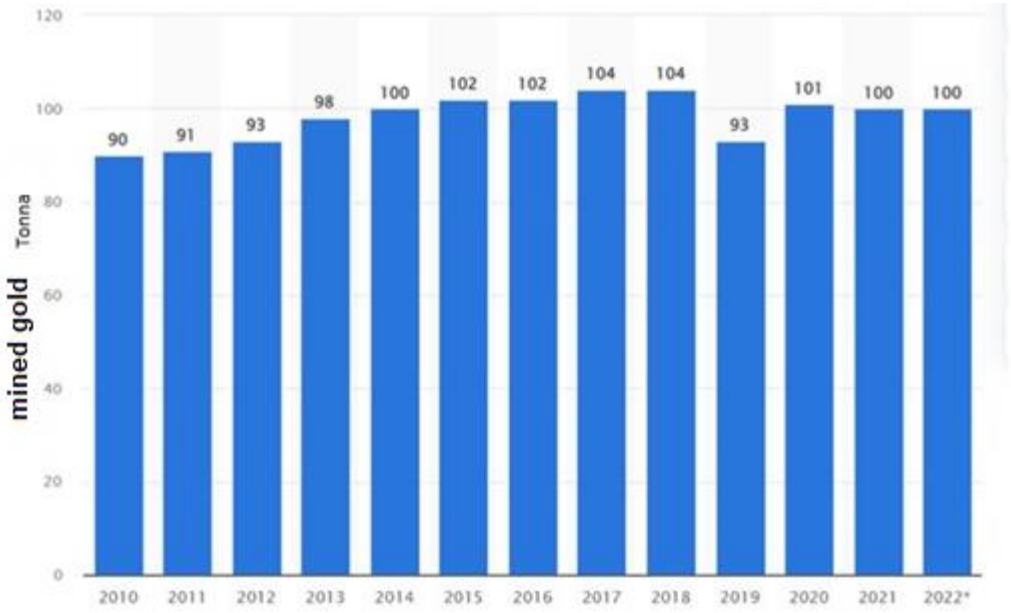


Figure 1.7.1 . in Uzbekistan years in the section digging received gold quantity

And in the technology sector, the demand for gold in 2021 increased by 9% and amounted to 330 tons. In these areas, gold is used mostly in the field of electronics - from mobile networks to the James Webb telescope, which was recently launched from the Earth in the Lagrange-2 "Sun-Earth" system and entered its orbit at a distance of 1.5 million km.

Figure 1.8. The price of gold in world markets

near future, the price of gold, most likely, may change depending on the real rate in the world markets. Of course, it will be necessary to strengthen the monetary and credit policy by the Central Banks, and to keep the system of measures aimed at increasing the efficiency of inflation control under certain control.

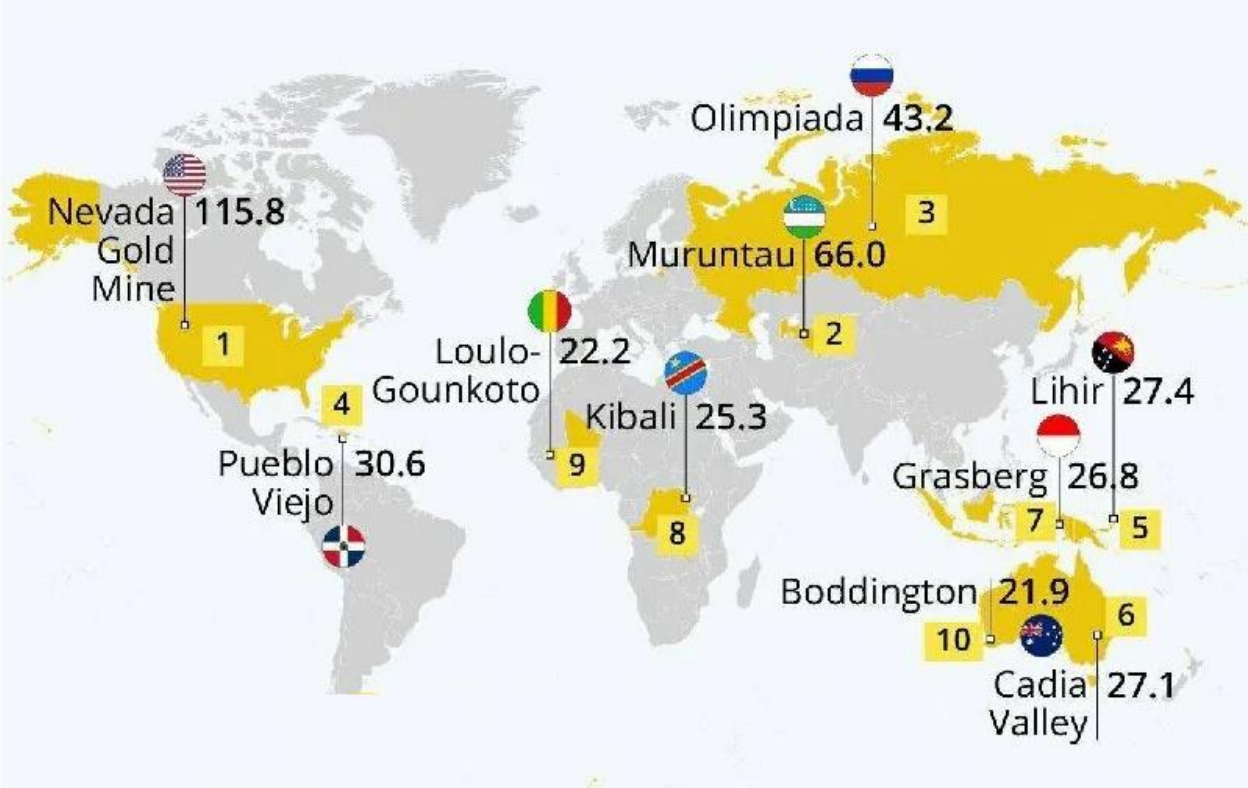


Figure 1.9. Large gold mines in the world

2 . ANALYSIS OF GOLD MINING PROCESSES IN UZBEKISTAN

2.1. Today's situation of the gold mining industry in Uzbekistan

The history of the emergence and development of gold production in Uzbekistan is inextricably linked with the history of mining in Central Asia, which began in the period before Christ. Because of its wonderful natural properties, gold has long been used as ornaments long before copper. According to archaeological finds and traces of ancient developments, it was found that gold mining began in Central Asia in the VI-IV centuries BC [9].

In the history of mankind, gold was mostly obtained from alluvial deposits by very simple methods - by washing gold sands. Only large particles of gold were extracted and wooden troughs covered with animal skins were used.

In the 17th-19th centuries, special scientific researches were conducted to study the mineral raw material base in Central Asia, geological maps were compiled, and some mines were described. But at that time, there were no big changes in the gold mining industry in terms of expansion of gold mining volume and technical equipment.

1930s , the "Uzbekoltinnodmet" trust was established, which included the wanted (starateli) department. At that time, along the Angren and Chirchik rivers and in the riverbeds at the foot of the Kurama mountains, gold was washed by the stratelliar method , and only a few tens of kg were produced per year. In the years after the Second World War, the search and identification of gold deposits was carried out, as a result, a number of deposits were explored in the gold-rich oases of the Chotkal, Pskem, Ugam, Sanalash, Chirchik, Angren rivers. In those years, the "Central Asian Gold Search" organization resumed gold prospecting [10] .

In the 1960s and 1980s, a number of scattered gold mines were searched for in the western ridges of the Nurota Mountains (Kattachi, Sent o b, Sop, Keskan, Temirqobik, Ok-Chop, etc.). Since the 1950s , fundamental works on the search and prospecting of gold mines have been started by the enterprises of the Academy of Sciences of Uzbekistan and

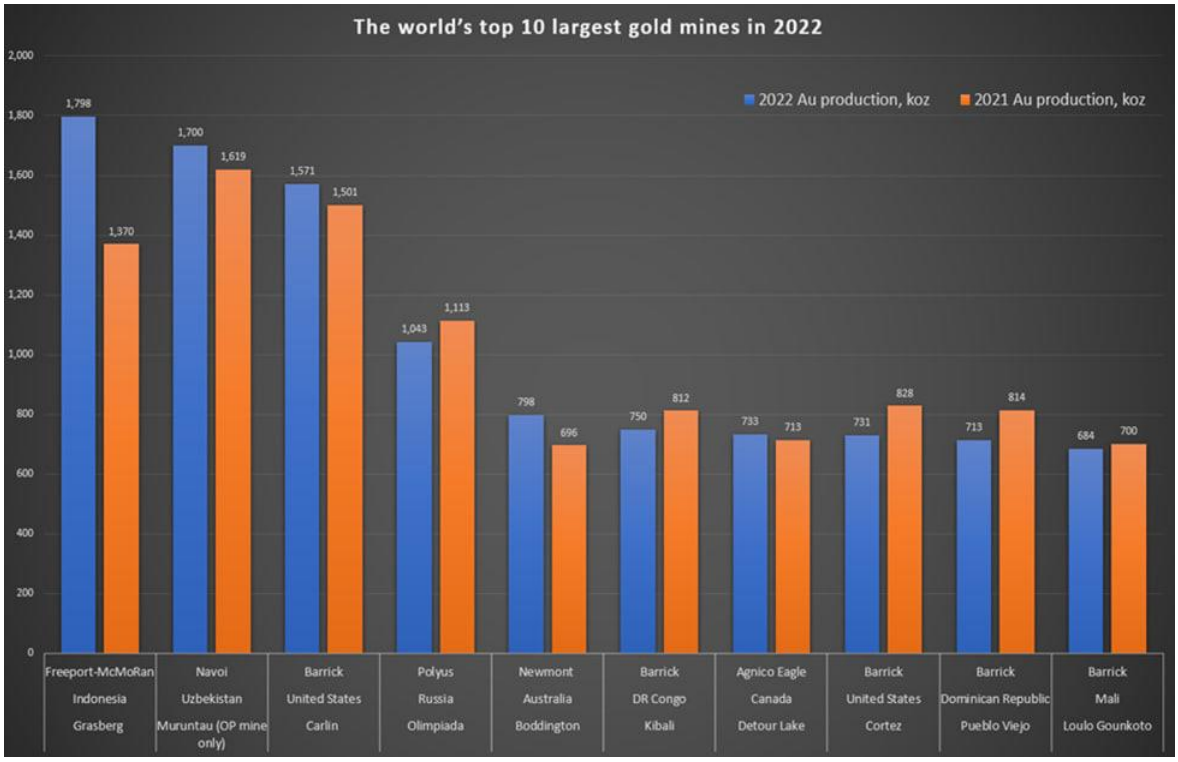
the Ministry of Geology, and in Muruntov, Karakoton, Bichanzor, Pirmirob, Guzaksoy, Kochbuloq, Kovuldi, Kizilolmasoy, Sarmich and other places, new gold mines were searched for.

These deposits were identified and involved in production with the participation of H.T.Tolaganov, V.G.Gorkovets, YE.I.Abramov, G.V.Gorev, G.V.Kasavchenko, A.Z.Poley, K.B.Shulyatnikov, V.A.Talalov, I.X.Kharamabayev, I.S.Sokol, A.A.Xlussov, V.V.Martinov, R.V.Soy, Y.A.CHernyavsky and many others.

In particular, academician H.M. Abdullayev's great service in identifying the world-class Muruntov mine made it possible to increase attention to the field of geological exploration of Uzbekistan. A geophysical expedition organized in 1958 with the participation of Kh.T. Tolaganov and V.G. Gorkovets, who continued his creative work, discovered an ore field with high gold content near the Bessopan well, which was a great discovery made in the second half of the 20th century. Geologists such as Y.N. Mordvintsev and P.N. Xramishkin led the geological party in the discovery of this discovery.

The mine discovered in Muruntov was recognized as the "mine of the century". In 2022, 1.7 million troy ounces of gold will be produced from the

Muruntov mine, making it the second largest producer of gold in the world after the "Grasberg" mine in Indonesia.



Today, the Muruntov quarry is 3.3 km long, 2.5 km wide, and over 600 meters deep.

According to the information provided by experts, the reserve of the "Muruntov" mine is 150 million ounces. Of course, this indicator allows this mine to maintain its status as the largest mine in the world in the near future.

In 1965, "Uzbekoltin" exploration and exploitation association and other gold mining enterprises were established on the base of gold mine prospectors.

In 1970, after the Chodak mine was put into use, the association "Uzbekoltin" began its activity.

In 1975, the Kochbulok mine and Angren gold processing factories were involved in production, and in 1977, the Kovuldi mine.

This made it possible for gold production to reach 150% of the rate of development in 1970-1980.

In 1980, the Marjonbulok gold mining complex was put into operation. In 1989, Zarmitan and Kyzil-olma mines were commissioned.

Thus, gold production in our country tripled in 1970-1989.

In accordance with the decree of the President of the Republic of Uzbekistan, in 1992, the State Committee for Precious Metals of the Republic of Uzbekistan was established on the basis of the "Uzbekoltin" association, and then in accordance with the decision number 150 of the Cabinet of Ministers of the Republic of Uzbekistan dated March 19, 1994 It was reorganized as "Ozolmosoltin" association.

From a geographical point of view, the gold-bearing deposits being developed in the mines are currently located in the western and eastern wings of Uzbekistan. Mines are characterized by different geographical and economic conditions: in eastern Uzbekistan, they are located in places close to the source of energy, technical and drinking water, roads and railways, labor force. In Western Uzbekistan, the mines are located far from the energy source, highways, and are distinguished by some inconveniences in their development - water scarcity and limited infrastructure. Most of the existing gold mines in Eastern Uzbekistan are located in intersections .

In the eastern part of the republic, the process of formation of gold mine and ore is different . They are located in gold ore fields in Angren - Almalik (Kochbuloq, Kizilolmasoy, Kovuldi, Akturpoq), Chodak (Pirmirob, Guzaksoy, Akbuloq, Chakmoktash), and Chotkal (prospective mines with small quantities of ores). A large amount of sulfide in these ores indicates that they belong to the gold sulfide-quartz formation. The shape of mining rocks is different.

Gold is unevenly distributed in all mine rocks. They are mainly characterized by the presence of silver. Also, it was found that the ore contains a significant amount of quartz (65-70%) and a mineral content favorable for technological processes (a small amount of arsenic and other substances).

Marjonbulok, Zarmitan, Karakoton mines serve as the raw material base for the Marjonbulok gold factory in Western Uzbekistan.

Eastern Uzbekistan, the Kochbuloq, Kizilolmasoi and Samarchuk mines operate as a material base for the Angren gold factory, while the Guzaksoy and Pirmirob mines are the material bases for the Chodak gold factory. The Kovuldi

mine sends the product it produces to the copper smelting plant of the Almalyk Mine Metallurgical Combine as flux raw material for the production of non-ferrous metals.

The mining process of K enterprises is carried out by simple and combined methods.

Due to the fact that most of the mines are located on the slopes of the mountains, in strongly intersected areas (Kochbulok, Pirmirob, Kovuldi), the method of opening these mines, which is considered to be more convenient from the economic and technical point of view, is to open the tunnels. In some cases, when it is inconvenient to open mines with shafts, they are opened with vertical shafts or uklons (Kochbuloq, Kovuldi, Kizilolmasoy). The Zarmiton mine was opened only with a vertical shaft. Later, in 1989, an additional traffic lane was designed.

When opening mines, the location of minerals, the relief of that land, the topography of the earth's surface and the size of the self-propelled equipment used, among other factors, are taken into account.

If we consider the production systems, the following production systems are used in mining operations:

• Kochbulok, Chodak, Karakoton and Zarmitan produce 60% of raw materials by stockpiling ore;

• Chambered - tabled (8.0%) - Kochbulok mine;

• Layered streaks (8.0%) - Zarmiton, Kochbulok, Kizyolmasoi;

• filling of excavated lands (14%) - Kovuldi, Kizyolmasoi;

• layered demolition (10%) - Kizyolmasoy.

Parameters of production systems:

- the height of the block is 50 - 60 m.

- the length of the block is 20-60 m.

gold extraction factories shows that the processing process of the factories depends on the mineral content of the ores.

1. The processing scheme of the Angren factory consists of gravitation and flotation, and the released intermediate product is sent to the Almalyk Mine Metallurgical Combine for processing as a gravitation and flotation concentrate.

2. The processing scheme of the Chodak gold extraction plant consists of three-stage grinding, two-stage compaction, refining, synthesis and finally filtration by precipitation of zinc dust.

3. Ballless two-stage coagulation, gravity enrichment, sorption and regeneration are carried out at the Marjonbulok factory. Thus, the intermediate products of the Chodak and Marjonbulok factories, that is, zinc deposits containing gold and cathode deposits, are sent to refining [10] .

It should be noted that extracting gold from zinc deposits is a labor-intensive process, and the cost per gram of gold is higher than that of concentrates and fluxes.

Enterprises carry out underground mining of mineral resources, which require a lot of labor and materials - vertical mine, shaft, etc. Only the surface of some mines is mined in an open way.

the open pit method is considered cheaper compared to the underground method, even if we take into account the costs of further technological work (land reclamation and environmental regulation).

Today, open pit mining is a priority for gold production in the world, for example, more than 80% of gold mines in the United States are open pit.

Over the course of almost 50 years, the reserves of the upper part of the Marjonbulok, Kovuldi and Chodak mines were mined and exhausted. Due to this, in recent years, the rate of growth of product production in underground mining enterprises has been observed to slow down. This is due to the decrease in the content of useful components in ores, despite the increase in the volume of ore processing.

In addition, it was found that the content of ores in some mining areas is much lower than the planned indicators. These and other circumstances have had an impact on the productivity and cost of production of underground mining

enterprises. The costs of using the lower part of the mines and its production costs are also increasing year by year.

In our opinion, these deposits can only pay off when finished products are sold at world market prices.

In mines, gold ores are embodied in almost all genetic types. They are found in magmatic, hydrothermal and scattered cases. Hydrothermal types of gold deposits are common and are divided into three groups:

1. Minerals with low temperature, surface layer (from several tens of meters to 0.5 - 1.0 km).

2. At medium depth (from 1.5 to 4-5 km) gold is found in the form of a mixture of pure and sulphides.

3. Deep, high-temperature minerals (above 4-5 km). 95-98% of the material composition of the mine is quartz, less - carbonate and other minerals.

Sulfides are divided into the following formations according to their amount:

1. Quart gold with up to 5% sulphide[1];

2. Sulfide-quartz gold with a sulfide content of 5% to 20% pyrite-arsenepyrite;

3. Sulphide gold with a sulphide content of up to 85 - 90%;

4. Gold-silver vulcanogenic low-temperature deposits are found in almost all hydrothermal deposits of minerals in Uzbekistan, located in the middle depth and in the surface layer.

raw material base of mines . According to the Ministry of Mining and Geology, at a briefing held in AOKA, a total of 2537 mineral deposits are included in the state balance of mineral reserves in our Republic, of which 1855 are construction materials, 296 are hydrocarbons, 128 are mining raw materials, 92 - precious metals, 61 - mining and chemical raw materials, 41 - radioactive metals, 31 - non-ferrous stones, 20 - non-ferrous and rare metals, 8 - coal and combustible shale and 5 of them consist of ferrous metal deposits.

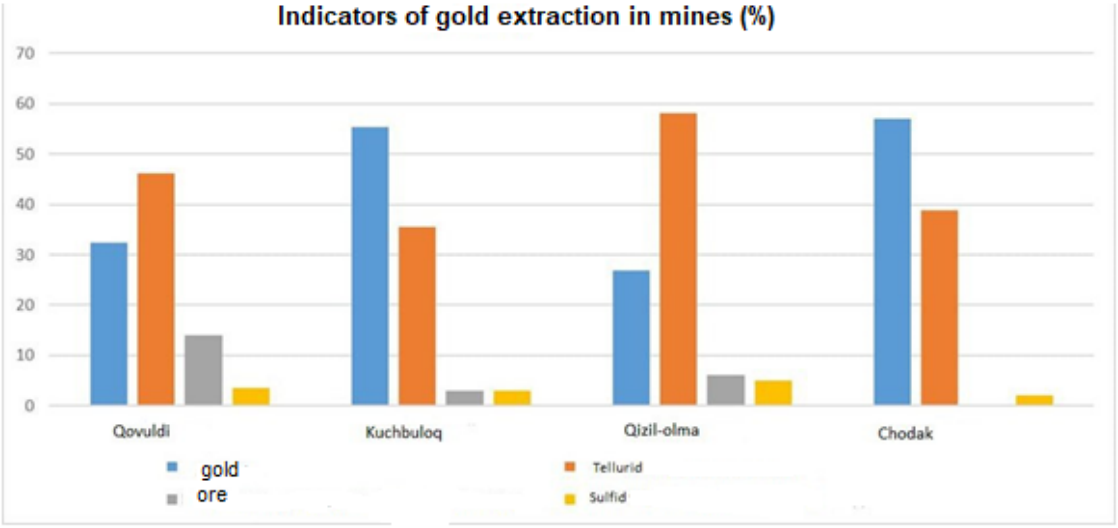
Today, 101 gold and 3 silver mines are taken into account, and the main part of these mines serves as the raw material base of the Navoi and Almalyk mining and metallurgical combines.

Gold ore deposits in Western Uzbekistan consist of Zarmitan, Marjonbulok, Karakoton, Bakmal, Sarmich, and are located between volcanic and sochma rocks.

In eastern Uzbekistan, Angren is located in small mines and prospective fields in Kochbuloq, Kyzyzolmasoy, Kovuldi, Okturpoq mines in Almalyk district and Pirmirab, Guzaksoy and Chotkal belonging to Chodak mine.

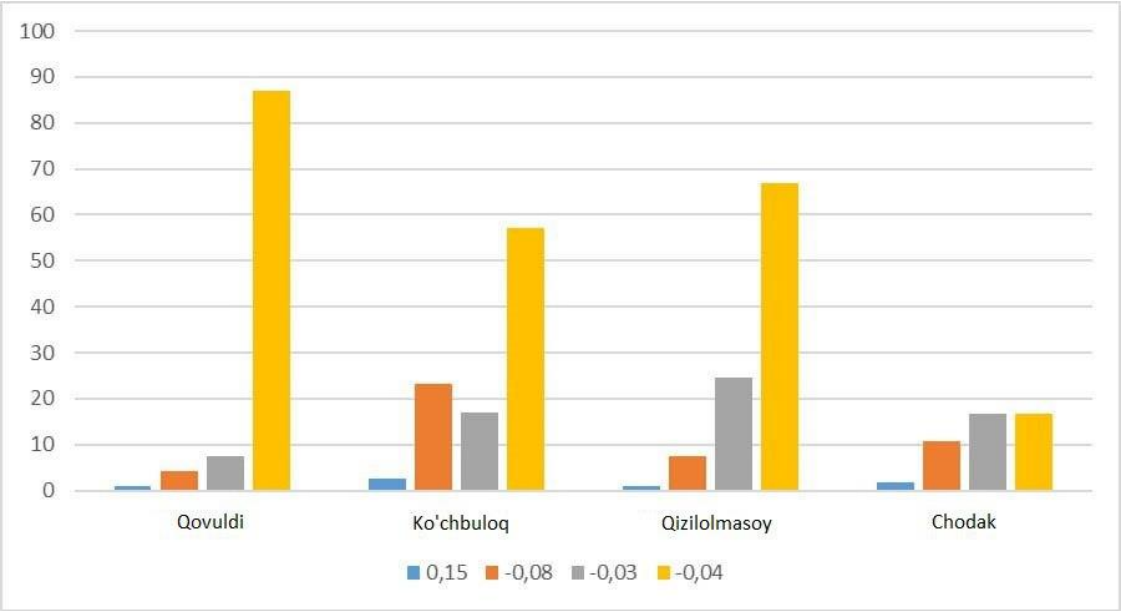
of ores (49%) are located in ores with a thickness of more than 5 meters and (44%) in ores with a thickness of 1-3 meters.

The distribution of gold in the mines is extremely uneven. Silver is constantly found in their composition. Ores contain 65-70% quartz, arsenic and other elements. O'zolmosoltin's balance sheet mines are characterized by a large amount of silver in ores. The ratio between gold and silver ranges from 1:1 to -1:12. Quantitative distribution of gold in all mines is shown in the following table:



It was compiled by the author based on the information of "Ozolmosoltin" association.

Gold mines discovered and discovered in the Republic In addition to attracting mining, the gold mining industry is also developing. In the composition of the ores of all gold mines, the base metal is almost in a powdery state, with a size distribution of 0.02 mm. from -0.2 mm. (see table 2.2).



According to the decision of the Cabinet of Ministers of the Republic of Uzbekistan "Measures to improve the management structures of the gold mining industry of the Republic of Uzbekistan" No. 145 dated June 26, 2002 Merger of KMK JSC and Navoiy KMK JSC was an important historical event in the field of management and future development of the gold industry.

The integration of these mines into two major industrial enterprises directly links the underground and open-pit mining processes, providing sufficient capacity for the existing gold extraction plants to operate at full capacity.

In addition, in the direction of integrated use of minerals, it opens the way to solving the urgent issue of organizing waste-free production in exchange for arming the existing factories with new modern technological lines.

If we think about open-pit mining, the Navoi mining and metallurgical combine is the basis of the concern "Kyzilkumnodmetoltin" and is considered the country's largest industrial enterprise. Along with uranium and gold mining, it is engaged in the production of phosphorite, sulfuric acid, jewelry, machinery, and daily necessities. The main reserves of gold are located in the Central Kyzylkum, embodied in mines such as Muruntov, Kokpatas, Dovgistov and Omontoytov.

The Muruntov mine, located in the west of the republic, is one of the world-class mines, and gold ores have been mined from this mine for almost 50 years.

From mined ores, high-quality gold with a purity of 999.9, recognized and certified in London and Tokyo, is produced in the GMZ-2 hydrometallurgical plant.

Since 1995, several small and medium-sized mines in Kokpatas and Muruntov have been brought into production. The launch of these mines made it possible for the Republic of Uzbekistan to hold the top positions in the world gold mining. It should be noted that the main goals of the Republic's geologists today are to improve the quality of exploration work and to find a second mine like the Muruntov mine. Along with the Muruntov mine, it is envisaged to involve in the development and production of medium and small-sized mines identified in the territories belonging to the concern "Kizilqumnodmetoltin".

The progress of modern science and technology is embodied in the Muruntov mine, and it is possible to see the state and composition of ores located in layers up to 600 meters deep on a computer.

Therefore, finding out in advance what kind of ores can be mined and when, as well as remote monitoring of ore mining and shipping processes, is reflected in the increase of production efficiency. The automated control system invented by the US firm "Integra group" is implemented by monitoring the mining and ore transportation in the quarry with the help of satellites.

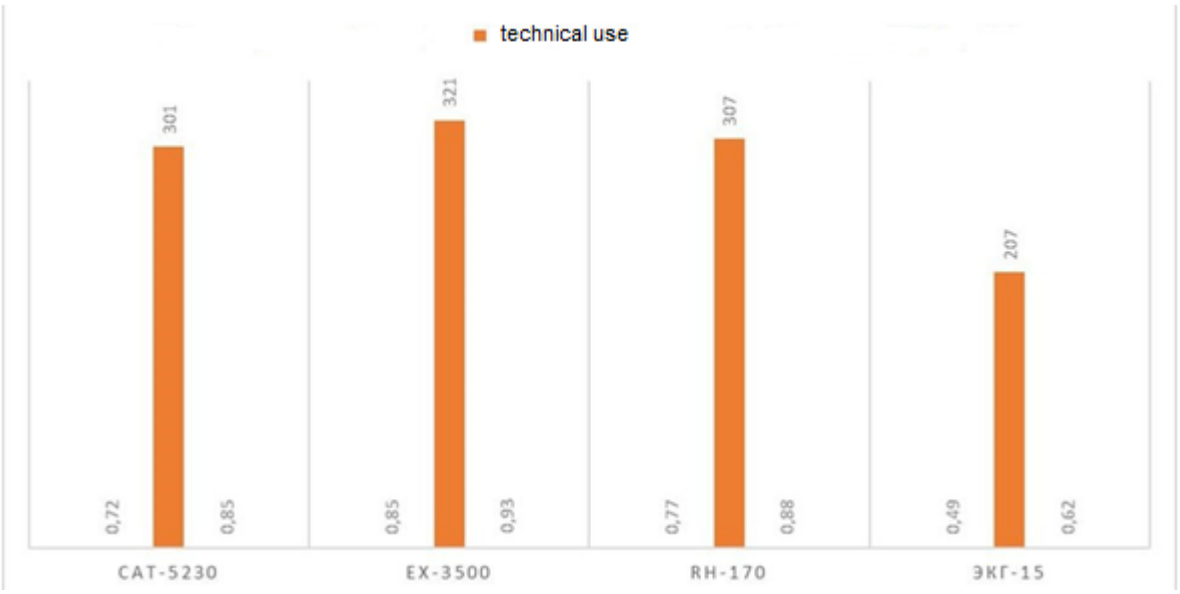
Involvement of such systems in production clearly proves in practice that it is very convenient to make quick decisions in the management system.

The volume of rocks extracted from the quarry exceeded 1 billion cubic meters in 2001.

Modern hydraulic Hitachi, Caterpillar, Orienstein and Koppel excavators and 136-ton Caterpillar and 170-ton Euklid trucks carry out mining and cargo transportation in the quarry . Their performance indicators are expressed in the following table:

Performance indicators of Muruntov mine excavators in 2001

Table 2.3



The Muruntov mine was compiled by the author based on the data

As can be seen from the table, it can be seen that the use of modern hydraulic excavators produced in the world in mining and loading works is extremely effective in the operation of the Muruntov mine, compared to the EKG brand excavators manufactured in Russia.

For a long time, the millions of tons of ore brought to the mines from the Muruntov mine, the compactness of energy and water resources, the development of the mining industry, and the presence of mining experts, have been attractive to foreign investors.

In the first year of our country's independence in 1992, the joint enterprise of Uzbekistan and the United States of America "Zarafshon-Newmont" was established for gold mining. In 1995, this joint venture produced the first series of gold. During its activity, the enterprise produced more than 80 tons of products and made a significant contribution to the currency fund of our Republic.

In addition, the joint venture "Zarispark" producing jewelry was established in the Navoi Mining and Metallurgical Combine together with the American firm "Yevrotrade International LTD". This enterprise has a production capacity of 7.7 tons of finished products per year. There are more than 400 types of jewelry with an authenticity level of 585 produced by the combine, which are of high quality and are in great demand in the world markets.

All funds invested in this joint venture have fully paid for themselves today, and now the enterprise continues to produce ready-made and high-quality products at the disposal of the joint venture.

Almaliq Mining and Metallurgical Combine is one of the largest mining and metallurgical combines producing non-ferrous metals in the Republic of Uzbekistan.

Millions of cubic meters (mz) of rock are mined annually at the combine. 13 different chemical elements are extracted from the mined rocks and 20 types of industrial products are produced. These products are of high quality and competitive and are in constant demand in the world markets. Regarding the production activity of the combine 2.3. we will stop in the paragraph.

Considering the activity of gold mining enterprises in the republic, we would like to make the following conclusions in this regard:

mining in Uzbekistan was analyzed. The main gold deposits were studied conditionally divided into the western and eastern regions of our country.

Cabinet Resolution No. 145 of June 26, 2002 on improving governance coordinates underground and open-pit mining processes and provides sufficient capacity for existing gold extraction plants to operate at full capacity;

- Raw material bases of the main gold separation factories, ore composition in mines, their production systems were covered in detail;

- The use of modern technical and technological advances in the processes of open and underground mining of mines - was recognized as one of the main factors of increasing production efficiency;

- Taking into account the value of underground ore mining, and based on world practical experience in this direction, it was emphasized to increase the scope of open mining of ores at the present time.

2.2. Organizational activity in the gold mining industry is the basis of an effective management system

A modern enterprise must have a highly efficient management system.

The production aspect of the management system in the gold mining industry is that it is a goal-oriented, socio-economic, organizational-technical, continuous process. In addition, this process is carried out in order to achieve economic and technical results through various methods and means.

In the gold mining mines of our republic, ores are mainly mined underground, and only the part of some mines located close to the surface of the earth is mined by open method. Intermediate products from mined ores are produced as finished products in enrichment and processing processes at Navoi and Almalyk mining metallurgical complexes.

According to the decision No. 145 of June 26, 2002 of the Cabinet of Ministers of the Republic of Uzbekistan on "Measures to improve the management structures of the gold mining industry of the Republic of Uzbekistan", the main gold mines belonging to the "Ozolmosoltin" association are Almalyk KMK and attached to Navoiy KMK enterprises.

The connection of these mines to two large industrial enterprises, in turn, led to changes in the production structures of Almalyk MMC and Navoi KMK.

" Ozolmosoltin" association were attached to the Almalyk KMK, the production organizational structure of the combine was shown in Figure 2.1.

It should be recognized that the establishment of the gold production sector among the copper, lead - pyh production sectors is one of the important changes introduced into the production structure of the combine. It should be noted that although gold production has been carried out at the combine since 1992, it was not reflected in the production structure due to its extraction from mines as a companion element.

In order to introduce the production of import-substituting ready-made products and expand the range of products in the conditions of the market economy, we emphasize the need to include in the organizational structure the

construction of a factory for the production of high-quality, competitive ready-made products, including jewelry, aimed at export. This proposal is reflected in the section related to gold production of the combined organizational structure.

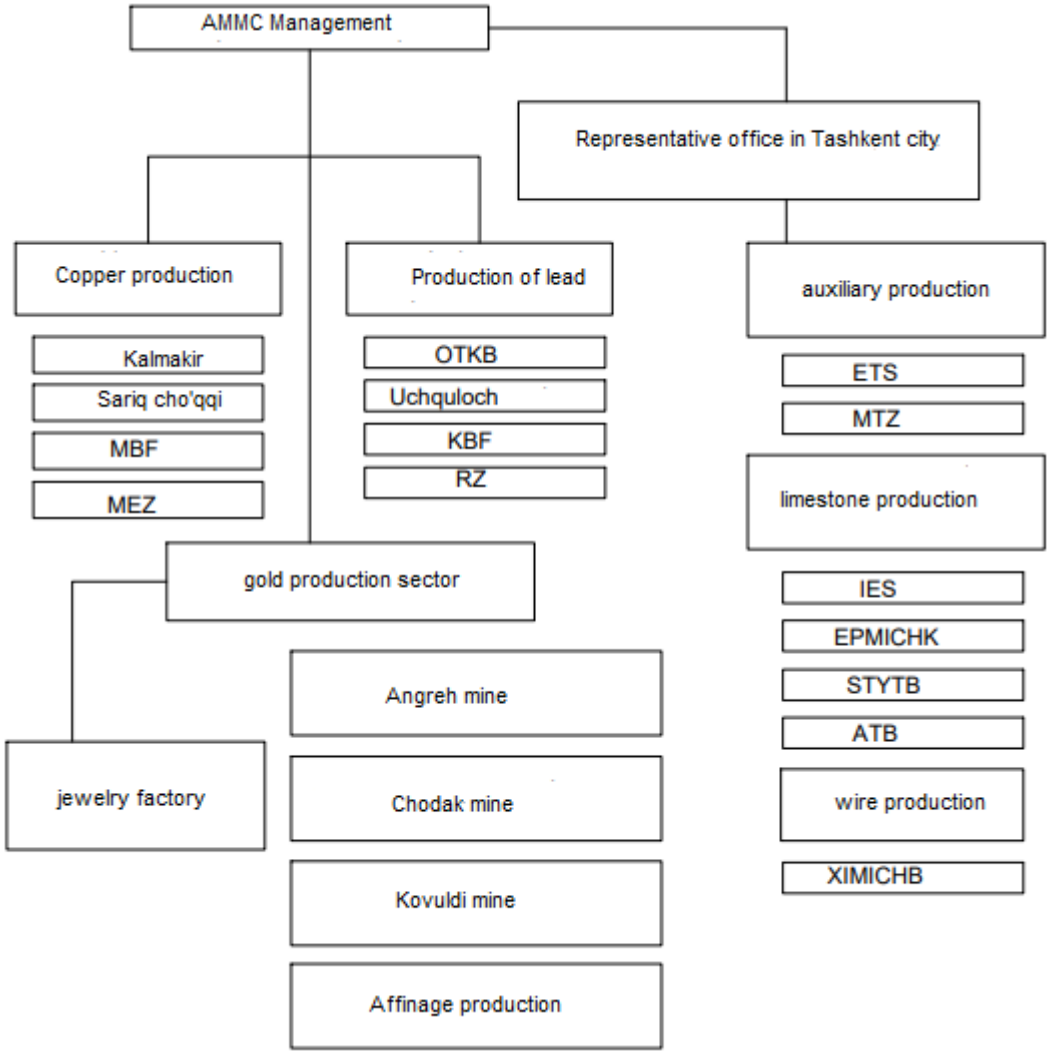


Figure 2.1. The production structure of AMMC recommended by the author.

Such a change in the production structure will create favorable conditions for the direct connection of underground and open-cast ore mining processes, and will also provide sufficient opportunities to ensure the full capacity of existing gold extraction factories. . In addition, factories operating in the direction of integrated use of underground minerals will create conditions for solving the urgent issue of organizing waste-free production in exchange for arming their work with new modern technological lines.

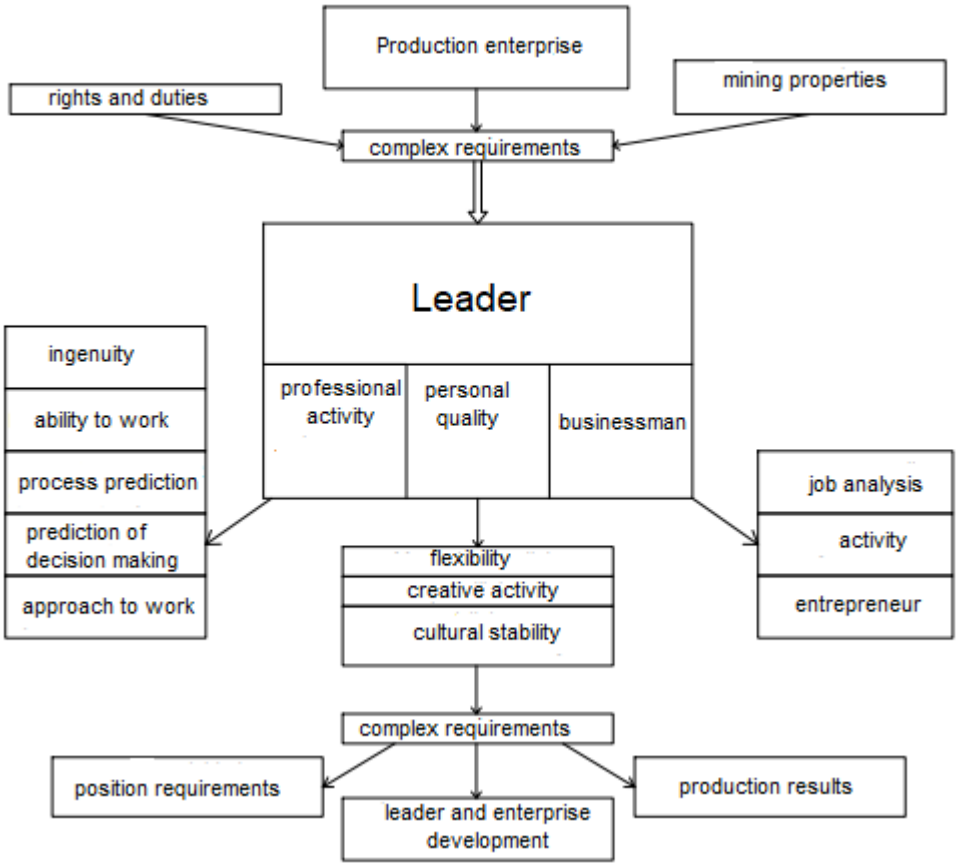
Practical activity shows that the bigger the extractive mining enterprises are ("Navoiy KMK" JSC, "Almalyk MMC" JSC), the level of its management hierarchy increases to a certain extent. It should be noted that the level of hierarchy in small gold mining enterprises is 2-3, in medium-sized enterprises it is 5-6, and in large associations, associations and production complexes it reaches 10-12.

The experience of foreign gold mining enterprises and the practice in this direction in our country show that the number of links between the leader and the worker should not exceed 4-5, otherwise the flow of information will slow down, and the time for quick decision-making will be delayed. lengthens, the effectiveness of management decreases and its reliability is undermined.

In world practice, making changes to the structures of firms or replacing them is one of the main indicators of managerial activity. The main factor of such changes is the scientific and technical progress and strong competitive environment in every field. For example, management structures in companies in the USA and Western European countries are changed on average every 3-5 years.

Therefore, the employee of the management system must have the necessary business skills and be highly educated. Organizational ability, a sense of innovation, the ability to appropriately evaluate new technical and organizational ideas, skill in their application, as well as one of the important qualities of work - efficiency are the main requirements for a manager.

mining x steps is selection, its principles, procedures and methods. The performance of management personnel of the gold mining industry is evaluated every three years. Assessment is carried out through attestation. In the process of attestation, issues related to the professional skills, behavior of employees, their responsibility, personal responsibilities and rights for the work they are responsible for are taken into account. The evaluation criterion model of the leader in the mining industry was developed by the author and is represented in the following picture.



2. Fig. 2. In the mining industry, leader is a criterion for evaluation as a management entity

It should be noted that the issues related to the training of personnel, their education, professional skills improvement, and advancement from the ranks of the service are actually less subject to the specific technologies being developed. In some cases, such work is carried out by the decision of the chief on his own authority according to the unwritten laws of the internal apparatus.

The large-scale implementation of exams, attestations or competitions for leadership positions is difficult due to some executives who are unable to deal with old ideas or adapt quickly to new developments.

Enterprises of the gold production industry are mainly engaged in mining, beneficiation, processing and obtaining finished products of natural resources available on our land. Industrial enterprises can be characterized by the following: mineral resources , connection with the external environment, horizontal division of labor, intellectual potential, vertical division of labor, etc. Their main resources

are material, financial, labor, technological and information exchange resources. In order to achieve the set goal, whether it is a mining enterprise or a processing enterprise, they need to direct tasks based on the vertical division of labor. ladi, as a result of which management functions are implemented. That is why the management system is mandatory in the activity of every organization.

The management function in management activities is performed by leaders - managers, in the gold mining industry, management is a series of processes that realize the main goal of the organization, which consists of functions such as planning, analysis, decision-making and control.

In large and complex enterprises (Navoiy KMK and Almalyk KMK), employees should know exactly from whom and what tasks they receive, because the management functions in such enterprises are very complex and multifaceted. Because of this, heads are appointed to each department and division, workshops and sections, and their duties, rights and responsibilities are clearly defined.

And the horizontal division of labor leads to the emergence of departments and divisions in the gold production industry enterprises, and for the proportional work of these departments and divisions, there is a need to conduct orientation work between them. As a result, management functions appear, and management levels are formed as a result of their vertical distribution. Management levels are divided into upper, middle and lower levels. At the top level there are managers such as the head of the organization and his deputies, at the middle level there are heads of departments, specialist employees, and at the lower level there are foremen (masters), shift supervisors.

Middle and lower managers act as organizers of certain types of work. Their duties include drawing up a general work plan, directing workers to work, leading the work, coordinating the harmony of work , and supervising the work being done. The main goal of labor resource management is to direct the abilities of employees and workers to work more efficiently. Practical activity in developed foreign countries and our country shows that if the enterprise is financially strong

and equipped with modern technologies, tactical management of production will be satisfactory, and strategic management will be promising.

For example, today, as a result of the year-by-year improvement of ore extraction, beneficiation and metallurgical processing technologies, the processes of processing 1.0-0.4g/t of gold masses in the waste of gold extraction factories are selective smelting, biological selective smelting, ores that are difficult to be enriched. Autoclave enrichment is carried out by extracting. Over the last 20 years, the increase in the weight of open-pit gold mining operations in the world from 30% to 70% has also shown its positive impact on the rapid development of the industry.

For example, in the USA, open pit mining is 80%, and processing is carried out through selective smelting technology, which is twice as cheap as conventional methods.

This processing technology was also effectively used in the Uzbek-US joint venture "Zarafshon-Newmont" established in our Republic, and according to the results of 2000, the cost of mining 1 ounce of gold was around 130 US dollars. ("UZReport". 18. 12.200 1. Ekonomicheskoye obozreniye. March 2002).

In the 1970s and 1980s, the rise in gold prices on world markets forced many countries to search for sufficient reserves of gold mines, thereby affecting the development of the industry, as well as the competitive environment among the world's leading gold mining companies. showed The increase in the weight of open-pit production, along with increasing the economic potential of these companies, created ample conditions for increasing the possibilities of profitable mining of mines. It is appropriate to distinguish two trends in the development of gold production:

- the first one is the expansion of base reserves of mineral raw materials due to the increase in the weight of geological exploration. This trend is observed in developed countries, China, Indonesia and other developing countries, including Central Asian countries;

• the second trend represents the decrease of gold production in some countries from year to year. For example, the Republic of South Africa produced 66.3% of the world's gold production in 1970, i.e. 1000 tons of gold, but by 2001 this figure was 21.1%, or 601 tons, and 399 was recorded in tons. The main reasons for this include the deterioration of the quality of ores in the mines, the decrease in their gold content, the deterioration of the technical conditions of the mine due to the deepening of the mines (above 4,500 meters), and, in turn, the increase in the cost of the manufactured products, and other technical and economic factors.

It is necessary for us to study the positive achievements made in the economic conditions of the developed countries, and to implement the achievements in the economic development of our Republic that are suitable for our national characteristics and conditions in all sectors of the national economy, including the gold mining industry.

In our opinion, we found it necessary to focus on the following directions in the organizational activities of the management of the gold industry of our country:

1. It is known from practice that, along with gold mining, it is necessary to carry out research on replacement of out-of-service reserves with reserves of new mines.

It is necessary for the national economy to constantly improve the quality of the geological works carried out for the preparation and development of the raw material base for the gold mining industry of our country. is to find promising reserves. It is necessary to consider the following:

increasing the weight of exploration activities aimed at finding long-term reserves;

• creation of a base of raw materials of rare metals that are of interest to investors in world markets;

• improving directions for attracting mineral deposits to production with the participation of foreign investments and shortening the terms of feasibility studies;

• in exchange for increasing the income of foreign economic activity funds, it includes arming with a new high-performance drill, geophysical equipment, etc.

2. The experience of establishing small gold mining enterprises in all developed countries shows that due to their high efficiency, the intended results can be achieved soon.

For example, in 1983, the total number of mining enterprises in developed countries was 7,700, of which 84%, or about 6,500, were small mining enterprises. In the US in 1972, 74% of businesses employed 20 people, or 93% of businesses employed 50 people in Colorado.

Therefore, in addition to the development of large gold-mining metallurgical complexes in our Republic, we recognize the issue of establishing and developing small gold-mining enterprises that can create a base of raw materials and quickly adapt to market conditions as one of today's urgent directions. no exaggeration.

In the establishment of such small extractive enterprises, first of all, it will be necessary to develop the state approach, procedures for granting loans, tax incentives and mechanisms for attracting non-state funds.

3. Interstate cooperation relations play an important role in the economic development of society. Today, in the world experience, mergers of existing firms and enterprises are practiced in order to reduce the costs of establishing new enterprises. As a result, in addition to saving financial resources, national program development processes are not repeated.

As a result of the expansion of inter-firm relations, a new type of management is emerging that manages production on a large scale. It has a positive effect on the rise of such management technologies, the reduction of production costs, the improvement of working conditions, the growth of professional skills, the expansion of markets due to effective globalization, and environmental protection and several other factors.

4. Involvement of natural resources in the production of industry remains one of the main factors of economic growth. In the conditions of the market economy, the production methods and processing technologies of these resources

are also changing. It should be noted that gold mining enterprises have their own characteristics, which should be paid special attention to.

Disproportionate distribution of costs and profits in the mining process is observed in the following cases: as time passes in the mines, the mining-technical conditions deteriorate in relation to the introduction of new technological solutions; production is affected to a certain extent by natural and geographical factors; constant increase in the prices of material resources is observed. From this point of view, in the selection of investment projects, for the profitable operation of the gold mining enterprise, it is necessary to provide technical and economic justification of mines in accordance with the level of extraction of valuable components from mined ores. These same characteristics have a significant impact on the economic efficiency of gold mining operations and are required to be taken into account when evaluating investment performance.

mines is considered a scientific and practical task, and its solution should first of all be focused on increasing the efficiency of mining in gold mining enterprises.

Such a mechanism should make it possible to increase the volume of ore extraction, increase the quality of manufactured products, and ensure competitiveness in the markets, along with the successful operation of enterprises in the conditions of market relations.

2.3. Digging up management of mining enterprises (in the case of the Almalyk mining and metallurgical combine)

In the early years of the 21st century, the Olmalik Mining and Metallurgical Combine (AMMC) began its activity in the conditions of high capacity mining and processing enterprises of precious and non-ferrous metals.

At the combine, millions of tons of ores are mined and processed, and 13 types of chemical elements are extracted from them. More than 20 goods and products are produced at AMMC, including: refined copper (cathodes), gold, silver, zinc (metal, ingot), technical selenium, tellurium, sulfuric acid, lead

enrichment, molybdenum, metallic cadmium , copper sheet, lead cake and a wide range of consumer goods are among them.

The main production capacities of the combine are first of all inextricably linked to reserves of copper-molybdenum and lead-zinc deposits. Mining and processing of ores for metals such as copper, molybdenum, gold and silver are considered efficient, and the main deposits have long-term reserves of these metals.

These reserves are mainly embodied in the Kalmokir and Sari-Cho'qi mines, and we will dwell on their work. Mining has been carried out at the Kalmakir mine since 1956. So far, 1,283 mln. more than tons of ore was mined, and more than 5,000,000 tons of copper were produced from them. The main ore reserve is 3 billion as of January 1, 1998. is a ton . A confirmed reserve can ensure uninterrupted operation of the quarry for 80-100 years. The design capacity of the mine is 30.0 mln. tons of ore. Today, it is extremely important to attract the "Uzokhdagi", "Shimiliy-Garbyy Balikti" and "Karabulok" fields to the production, which are located around the Kalmokir mine, to replenish the depleted reserves (Appendix 2). The total reserves of these mines are equal to the reserves of the current Kalmokir mine, "Uzokhdagi" - 78%, "Shimali-Garby Balikti" - 10% and "Karabulok" - 12%. It should be noted that the average content of copper, which is the main metal in these mines, in the ores is 1.1 times higher than in the "Kalmokir" mine. Molybdenum, gold, silver, etc. differ relatively little in the composition of the ores. The mine-geological conditions of these mines practically make them provides an opportunity for full open mining: the depth of the "Uzodagi", "North-Garby Balikti" mines is up to -700 meters, and the depth of the "Karabulok" mine is up to -400 meters.

The close location of these mines indicates that they can be mined within one large quarry in exchange for the expansion of the "Kalmokir" quarry area. The implementation of these works will lead to the expansion of the length of the "Kalmokir" mine by 7 km and its width by 3 km in the future. However, today

(July 1, 2020) the length of the quarry is 3.5 km. and its width is 1.9 km, depth is 485 meters from the initial ground level.

Practice shows that as the quarry deepens, its environmental condition worsens, therefore, in order to reduce the cost of transporting ore and rock and improve the environmental condition, it is planned to build 2 high-performance crushing conveyor complexes in the mine in the future.

Ore is also mined in the open pit at the Sari - C h oqqi mine. Dimensions of the quarry: length - 1.8 km, width - 1 km, depth - 0.25 km. The planned ore mining capacity is 4 million tons. The reserve of the mine on January 1, 1998 was 85 mln. tons, and today the last processes of mining can be observed in the mine.

the market economy has created opportunities to increase economic efficiency, improve financial indicators, and apply new business management methods in the management activities of the combine. The implementation of these required the precise, timely and quality fulfillment of the contractual obligations concluded from the first days of 1991.

In the early years of our republic's independence, the rate of price growth was observed, along with this, the cases of falling prices of lead and zinc in the world markets caused damage to the high profitability of the lead-spirit production of AMMC. caused it to become an enterprise.

Possible price conjuncture in the market requires making some changes in technologies in the management activity of the enterprise. In such a situation, the combine was forced to stop the production of lead-spirit, in order to properly solve the problem, the production capacities and technologies of the lead-spirit beneficiation plant were used to re-produce ores. adaptation was envisaged. New copper processing technology began to operate at a rapid pace.

In 1995, as a result of these actions, the processing of copper ores at the Sari-Cho'qi mine stopped working at a loss, which made it possible for the combine to obtain 4.3 tons of additional copper.

In 1993, taking into account the prospects for the development of mining and quarrying, work was carried out to ensure the continuity of blasting processes in

combined mines. In July of this year, a memorandum was received from the company "IMS Associates" regarding the purchase of a factory producing emulsion explosives with its technologies. For the production of this explosive in accordance with the technology, the combine sent the company copies of components such as ammonium nitrate, oleic acid and perlite. the compatibility of explosives with the technology was studied by experts in the US mines .

According to the decision of the Cabinet of Ministers No. 530, adopted on October 31, 1994, the Ministry of Finance allocated a loan for the combine and mobilized it for the repair work of the copper beneficiation factory, the replacement of old equipment and equipment in technological processes, as well as for repair and restoration work.

As a result, the decline in production stalled and a state of stagnation emerged. Product production indicators accelerated in the enrichment and processing enterprises of the combine.

In general, the year 1995 completely stopped the decrease in production rates in the work of the combine and opened a wide way for its development.

To stabilize the economy, measures were taken to increase the volume of precious and non-ferrous metals for export, because at that time the demand for copper in the world markets was at a high level. In 1995, 1,500 tons of copper were exported to the world markets, and the price of tolling services was 30.2 million. amounted to US dollars.

According to the "Repair and technical rearmament investment program" drawn up in the Almalyk MMC:

introduction of production of import-substituting materials and equipment,

increasing the volume of production of gold, silver, copper,

to launch the production of high-quality finished copper products, and to expand the combined export potential as much as possible due to these measures.

If we consider the development processes of gold and silver production in Almalyk MMC:

Since the 1990s, a number of activities carried out for the production of "gold and silver" at AMMC - during the period when our Republic gained independence and was recognized as a sovereign state - was a set of serious actions aimed at gaining the name of "currency shop" in the Republic.

the former Soviet Union, the combine began to produce a "dore" mixture of gold and silver. But this manufactured product was taken out of the Republic. The highest possible separation of gold and silver components is the main technological requirement for this product. According to the decision of the Cabinet of Ministers of the Republic of Uzbekistan, the gold and silver production workshop at the copper factory was completed quickly.

The first batch of the product was produced on December 24, 1991. On the same day, the first batch of silver was produced, and two days later, on December 26, the first batch of gold was produced.

Thus, a new shop for production of precious metals, gold and silver began to operate under the copper plant of AMMC .

It was not easy to enter the world market with these precious metals being produced. First of all, it was necessary to have a certificate giving the status of "quality product" in the precious metals market in London. This association demanded a strict requirement for the accreditors of their metal, that is, buyers of this metal on the world market must not have any claims regarding the purchased metal for 5 years. For silver, this period is 3 years.

The purity level of the gold produced at AMMC is "999.9", and this precious metal has been tested by major banks in the world. The Association of Precious Metals in London regularly tested the silver of Almalyk MMC for 4 years instead of 3 years, and finally, in 1996, this product was accredited. At that time, Shirley Carson, the general manager of the Birmingham Analytical Chamber, admitted: "Uzbek silver has successfully passed even the most severe tests we have conducted."

In the central analytical laboratory of the combine, the chemical composition of mined ores, the composition of intermediate products in the

enrichment and metallurgical smelting processes, and the quality of manufactured products are checked . In the laboratory, 45 elements of Mendeleev's periodic system and 3 - 3.5 thousand samples are determined every day.

In 1997, AMMC produced the first experimental series of silver in the form of rounded grains, which in terms of quality are not inferior to foreign copies of this type.

This type of precious metal is widely used in the jewelry industry and the radio equipment industry.

On October 27, 1997, the London Precious Metals Exchange "Almalyk MMC" gold ingots received a certificate of quality product status. It was observed for the first time in the world experience that one enterprise has received such a status for two types of products within one year. When it comes to gold, the director of the world's largest precious metals factory, Bill Stever (Great Britain), said: "Your gold should be kept in a museum without selling it, because it is very beautiful. Before I - before you bring the gold to the laboratory analysis, it is specially I thought you would shine, I see, and I'm sure it's a most excellent job."

Next, one of the main tasks in this direction was the registration of AMMC's cathode copper on the London precious metals market. The attestation was carried out in cooperation with the company "Dgeneral Metalz LTD" and it also ended with a positive result in a short period of time.

As a result of these works, AMMC in 1997 increased the volume of export of products abroad by 20 times compared to 1991.

The program developed by the combine envisages regular increase of the export potential and increasing its volume several times until 2030. Today, 100% of the products produced at AMMC are exported, and these products are bought by about 20 countries on different continents of the world. In addition, the combine began to produce two more types of products for export. It is a combination of enameled wire and SAM (zinc, aluminum, copper) , which is in great demand in the Republic of Uzbekistan, especially in the Ministry of Energy, the aviation plant in the capital, the tractor plant, and the enterprises operating in Navoi, Samarkand

and Bukhara regions. is high. SAM mixture is produced in 5000 tons per year and is widely used in machine-building industry, in the production of furniture and fittings, and in other sectors of the national economy. The demand for it is high not only in our Republic, but also abroad.

Due to the fact that the main production product of AMMC is copper, the construction of a copper pipe factory in Angren is extremely effective in the production of tubes similar to car radiators for the needs of the UzDEUavto plant located in Asaka, as well as similar tubes for air conditioners and refrigerators.

Another large-scale program of the combine is to launch and expand the production of import-substituting goods. Currently, two main types of products are produced in this direction:

1. Emulsion explosives are produced:

For many years, about 5 million US dollars worth of expensive TNT - an explosive substance - was bought from abroad, which was a heavy burden on the economy of the combine. In the conditions of the market economy, this was one of the main factors that had a negative impact on the economy of the combine.

In order to solve this problem, on January 20, 1995, an agreement was signed on the purchase of a factory producing 40,000 tons of emulsion explosives per year in cooperation with " Almalyk MMC " JSC and "IMS Associates".

The construction of the plant continued quickly and was completed within 7 months. The combine spent 5 million US dollars in sums on the construction of the plant, but at the same time it is saving 8 million US dollars a year.

These costs were fully paid for by the end of 1998. covered In addition, AMMC regularly supplies "Uzbekkomir" enterprises, Industrial building materials and other enterprises with emulsion explosives.

2. Sulfite - bisulfite ammonium reagents are being produced,

Specialists of the Almalyk Mining and Metallurgical Combine, in cooperation with the specialists of the "Sredazniprotsvetmet" Institute, developed the technology of production of SBA reagents and the method of using it in ore enrichment processes. Experiments conducted in scientific and laboratory

conditions have shown that this product can be fully used in place of reagents imported at value prices. As a result, the plant stopped importing sernite - sodium, which in turn created conditions for saving one million US dollars.

The work, research, and accumulated experience of recent years show that the market economy does not like the moods of waiting, waiting, lack of enthusiasm, but on the contrary, it encourages the use of risks with intelligence, constant search, cooperation with foreign partners. mobilizes to establish contacts, to arm production with new high-performance techniques and technologies.

In order to further improve the economy, the combine is studying the exemplary experiences of well-known companies of countries with developed economies, including the USA, Japan, Canada, Germany, England, and Finland.

The positive experiences gathered in them ensure the creation of new opportunities in the future work of the combine, in the way of deepening market economy reforms.

One of the main areas of focus in the activities of the combine is social protection issues. The effective system of measures such as proper organization of social protection in the conditions of the market economy, organization of working conditions for each employee in accordance with the requirements of the times, expansion of sanatorium-prophylactic services for their health , and improvement of the effectiveness of medical services in treatment facilities are the effective system of the Almalyk Mining and Metallurgical Combine. creates a solid foundation for its operation and development.

On February 10, 1997, the Cabinet of Ministers of the Republic of Uzbekistan adopted a decision to transform AMMC into a joint-stock company. In connection with this issue, explanatory work was first carried out in enterprises, workshops and sections of the combine, and then a conference was held with the participation of workers. A statement on the joint-stock company was adopted. In accordance with the decision of the Cabinet of Ministers of the Republic of Uzbekistan, the share of the state in the joint stockization was set at 51%, for

foreign investors to buy with free currency - 46.5%, and the share of the workers of the combined company - 2.5%. .

Today, the authorized fund is 69,766,666 thousand soums or 1,029,050 thousand US dollars (at the exchange rate of December 15, 1998). It should be noted that the total value of the joint venture for foreign investors is 478 mln. It announced an international tender for the sale of a 46.5% share package in US dollars.

However, due to the fact that the investment attractiveness of the combine is not very high at the moment, and due to the lack of interest of the firms or companies participating in the process of joint stockization of the combine with about 500 million US dollars in the world at the same time, this tender did not register the expected result.

Analyzing the process of promotion of Olmaliq KMK, the following can be recognized:

First , it is natural that 51% of the State's share in the process of corporatization requires foreign investors to approach this issue with a certain degree of caution, because the state, while having the main package of shares, maintains its intervention in the daily management activities of the joint-stock company. remains;

- According to the experience of developed countries and the opinion of the World Bank in this regard, such a situation in the conditions of a market economy is in a certain sense necessary for the entry of foreign investments into the country's economy, the processes of economic liberalization, and the transition to market relations. hinders;
- On the other hand, it is also natural to ask the question to what extent large enterprises are compatible with the investment strategy of foreign investors. It should be noted that due to the fact that AMMC does not belong to the group of enterprises that bring large profits for investors in a short period of time, its investment attractiveness is lower compared to enterprises in other sectors of the national economy.

Therefore, based on the experience of putting the 46.5% share package allocated for foreign investors to the international tender and to what extent it was completed, we found it necessary to offer the following.

The process of privatization of the combine should be carried out in two stages:

- in the first stage, to increase the volume of mining of ores, processing and production of finished products and to introduce the production of jewelry, to keep the annual profit and activity of the combine stable at a highly profitable level. Due to this, it is possible to increase the attractiveness of the profit margin of each share;
- in the second stage, in accordance with the investment projects developed by the combine, the 46.5% share package will be freely sold on foreign securities markets. To achieve the goals of these two stages, we put forward the following proposals:
- Ensuring the state guarantee of investment projects of the combine;
- introduction of a consortium of two or three companies that combine their efforts and financial resources to implement the privatization process;
- Transfer of 51% of the state's share to a trust management consortium for a certain period (for example, up to 25% to one of the three companies);
- In exchange for guaranteeing free sale and free export of manufactured finished products, exempting them from sale through Central Export;
- providing necessary permits for opening subsidiaries and representative offices abroad;
- creation of benefits in the field of taxation during the period of repair and technical rearmament of combined enterprises;
- transfer of communal economy and social-cultural objects at the disposal of the combine to the powers of local governments;
- bringing the price of produced precious metals to the level of prices in the world market, etc

On December 7, 2001, the law of the Republic of Uzbekistan "On the level of authenticity and labeling of articles made of precious metals" was announced. The main purpose of this law is to determine the level of authenticity (probe) of articles made of precious metals intended for sale is to regulate relations in the field of marking, according to which the purity level of precious metal products determines how many units of precious metal are present in a thousand weight units of the alloy, and this is expressed by Arabic numerals. The metric system of the purity level in the Republic of Uzbekistan is as follows:

Gold - 375, 500, 583, 585, 750, 916, 958, 999

Silver - 800, 875, 916, 925, 960, 999

Platinum - 950, 999

Palladium - 500, 850, 999

Also, this law specifies the procedures for marking goods made of precious metals imported and exported to the Republic.

The aforementioned law will inevitably have a positive impact on the work of the Almalyk Mining and Metallurgical Combine, especially on its high-quality products taking a firm place in the world markets. (Law of the Republic of Uzbekistan on the level of authenticity and marking of articles made of precious metals . December 7, 2001. People's word. 2002).

Considering the activities of the mining and processing enterprises, it is worth noting that the impact of the industry on the environment is directly related to the current environmental situation.

Today, about 600-650 million tons of industrial waste from the copper and lead enrichment factories are lying in landfills around the city of Almalyk. The development of the industry shows the tendency of these piles to increase in volume from year to year.

In our opinion, the use of these wastes in industry and construction (brick, flux, cement, insulating materials) in the direction of improving the existing environmental conditions in the city is one of the main problems today. There are some projects and proposals regarding the involvement of the waste of copper and

lead enrichment plants in the production of cheap raw materials. But the State Geological Committee, taking into account that these wastes contain certain amounts of non-ferrous metals such as copper, lead, zinc, gold, silver, and rare metals such as rhenium, selenium, tellurium, indium, osmium, cadmium, and palladium. cannot make decisions on projects and proposals.

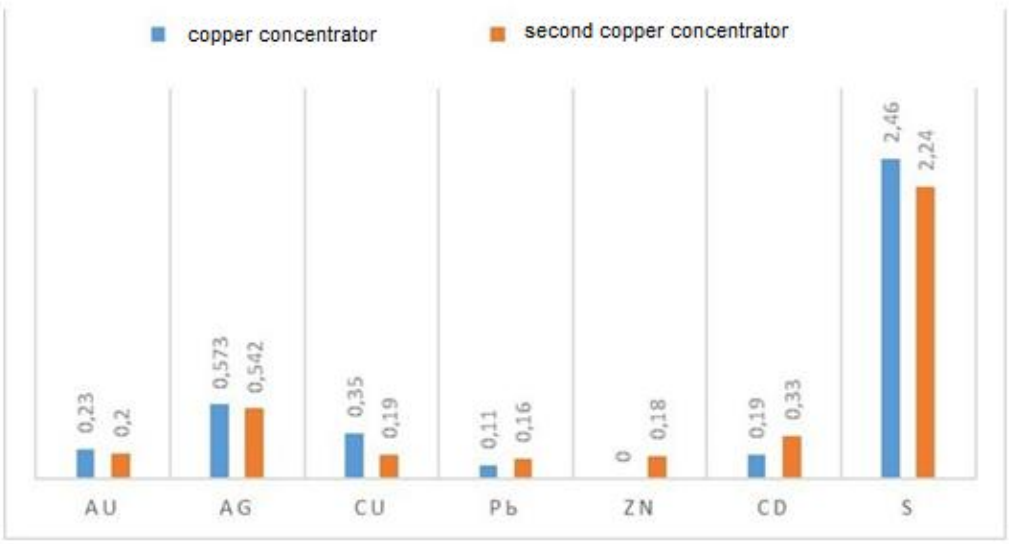
It is known from research that copper-molybdenum ores contain satellite components such as gallium, gold, silver, rhenium, and osmium.

When the copper beneficiation plant was commissioned in 1963, it was treated with 1% copper ore, but today it is 0.3-0.4% copper ore. the following table shows the chemical composition of the wastes of AMMC factories.

Based on the research conducted by M. Askarov, S. Abdurakhmonov, M. Mutalova, copper and **lead** the content of copper in the tailings of enrichment factories indicates that it is ready for enrichment together with similar ores. Extraction of useful components from waste has gained great importance in the world experience, and the main attention is paid to the complex use of **minerals** .

Table 2.4

Chemical composition of wastes in Dump



At the Kan, Kansai, Kairaktin, Kwaisin and Sentralnaya factories in the CIS countries, waste processing is carried out by flotation, as in ore processing.

Before flotation, the waste is subjected to a grinding step to fully extract useful components, and 80% of metals can be extracted during the beneficiation process.

In the factories "Chino", "Arthur" and "Manto" in the USA, the process of obtaining enrichment from waste is carried out in a separate cycle (Uzbekistan Mining Bulletin, Scientific-Technical and Production Journal No. 2. 2000).

The waste processing technology of the copper and lead beneficiation factories of the Almalyk Mining and Metallurgical Combine is represented in the following picture:

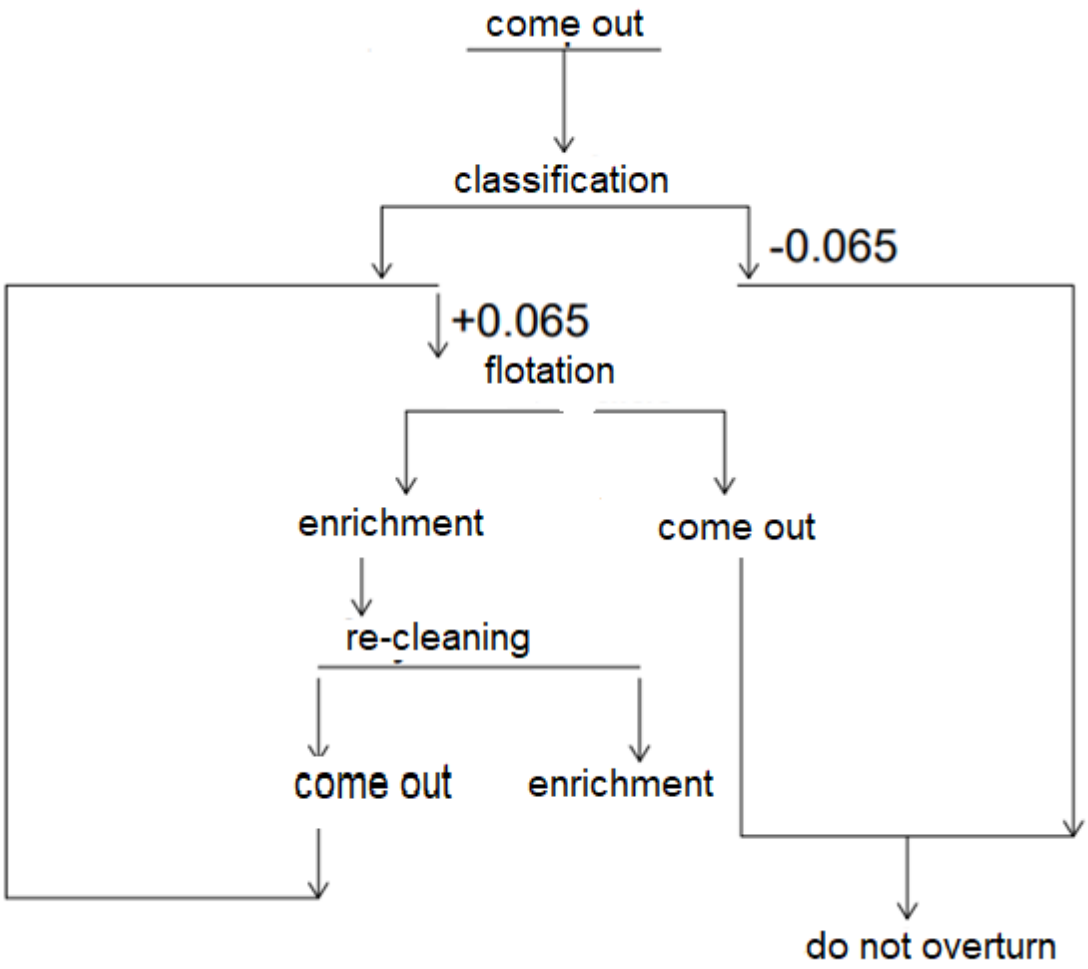
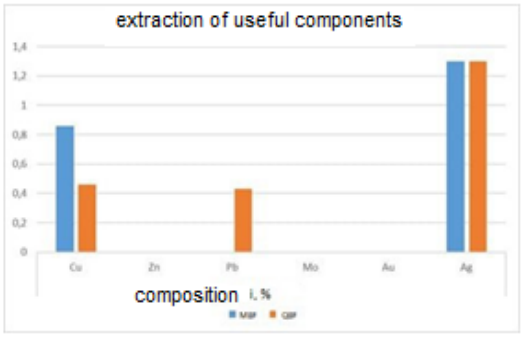
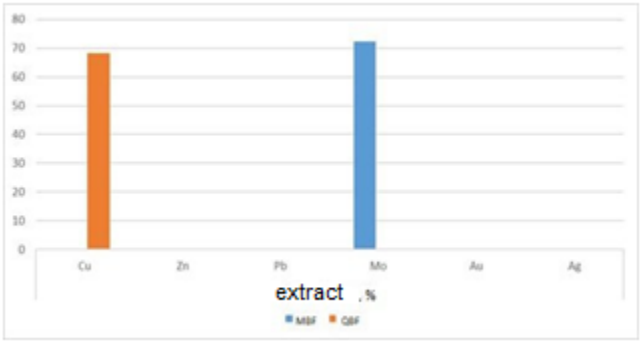


Figure 2.3. A diagram of the recycling technology.

As a result of the conducted chemical and mineralogical analysis, it was found that (in the technological scheme of extracting useful components from waste, 80-88% of sandy fractions can be extracted by flotation after passing through the stage of grinding to a size of 0.074 mm [11].

Extraction of useful components





1. The compositional characteristics of waste from copper and lead beneficiation factories collected around the city of Almalyk were studied, and copper, lead, gold, silver, spirit were extracted from factory waste in the direction of integrated use of minerals. we emphasize the need to create technologies of extraction.

affect the production efficiency are highlighted, the stages of development of the production of finished products in the combined enterprises, the possibilities of exporting precious metals to the world markets are highlighted. researched;

3. The analysis of the process of privatization of the combine shows that, in our opinion, the process of privatization of the Almalyk mining and metallurgical combine specializing in the production of precious and non-ferrous metals in our republic should be carried out in two stages:

- in the first stage, in exchange for increasing the volume of mining of ores, processing and production of finished products, as well as introducing the production of jewelry, the amount of annual profit and activity of the combine will be brought to a highly profitable, stable level and maintained in this state for a long time. . Due to this, it is possible to increase the attractiveness of the profit margin of each share;
- in the second stage, in accordance with the investment projects developed by the combine, the 46.5% share package will be freely sold on foreign stock markets.

4. Based on the study of the impact of mining enterprises on the environment and the environmental conditions that have arisen as a result, it can be noted that increasing the comprehensive use of mineral raw materials, full use of existing production capacities, waste-free production in the industry issues such as implementation remain one of the urgent issues facing the industry.

of the combine , it is necessary to attract mines located close to enrichment and metallurgical processing complexes to production, and in return to increase the volume of production of non-ferrous and precious metals in the republic, to expand the range of export-oriented products, to occupy foreign markets, as well as to increase foreign exchange revenues to the treasury of our country. There are tasks such as multiplication.

Today, in addition to the Kalmokir and Sari Choqqi mines, the involvement of the Uzodagi, Shimiliy-gharbiy Baliqti and Karabuluk mines, which are located around the Kalmokir mine, in the future will be valuable and colorful in the Almalik mine-metallurgical combine. makes it possible to increase metal production capacities several times.

Of course, first of all, attracting mines to development should be carried out step by step, taking into account the needs of the mining industry and the national economy in the Republic, as well as the price situation in the world markets.

2.4. Ways to increase the efficiency of gold mining in Uzbekistan

The answer to the question of what factors can have an effect on increasing the production efficiency in the gold mining industry in our country can be found in the following.

1. It is known that natural - geographical, organizational, economic, social and many other factors that increase its efficiency affect production efficiency in the mining sector;

2. First of all, natural factors influence the increase of production efficiency in gold mining, beneficiation and metallurgical processing enterprises. Natural conditions

can be one of the determining and deciding factors of efficiency in mining and processing enterprises of the industry;

3. The location of mineral raw materials (the shape and structure of minerals, depth, water content, the presence of mixed rocks and their strength), depending on how it is mined (open or underground), the tools and equipment used strength and character also significantly affect production efficiency. Production efficiency in open works is several times higher than in underground works;

4. In non-ferrous metallurgy, factors such as the presence of non-ferrous and rare metals in ores, useful and harmful mixtures and mineralogical compositions in rocks also affect production efficiency;

5. Increasing production efficiency depends on the composition and technical level of labor tools, the progress of advanced technological processes in production, the level of automation and mechanization. The rise of techniques and technologies and the development of techniques require the appropriate reorganization of production. In order to efficiently use production reserves, there is a need to organize labor and production in accordance with the requirements of the time.

In our opinion, the most efficient form of labor organization in mining works is the form of a complex brigade, which simultaneously performs all the work related to mining, such as preparation, demolition, loading, fixing. The organization of work in this way is the basis for reducing the cost of 1 ton of mined rock by one third.

The increase in material interest of workers and employees as a result of their work is the economic factors of increasing production efficiency.

The set of social factors that increase production efficiency consists of cultural-technical, moral-political maturity of personnel, moral incentive to work, location of the enterprise, labor discipline, work and living conditions created for workers and employees.

Internal production factors of the industry - the technical and organizational level of production, the economic activity of enterprises, the economy of material and energy resources, the growth of labor productivity, the efficient use of production capacities, capital funds, the organization of labor, production and management is

directly related to the improvement of performance, the saving of costs of production service and management, the elimination of costs and expenses not related to production.

Therefore, taking into account the regional location of Uzbekistan, that is, the location of the gold production industry, natural and climatic conditions, the growth of labor resources, the attachment of employees to permanent specialist workers, the development of the industry requires labor and material resources and production capacities. issues of productive use take priority.

In the scientific and practical research conducted in the CIS countries on improving the efficiency of the gold mining sector, unique methodological methods have been developed and are being used on a large scale in practice.

It is worth noting that, taking into account the working conditions of industry enterprises, controlling all the requirements of economic laws, economic analysis is of great importance in the process of determining the ways of rational use of mineral raw materials. Its main task is to study the economy of the industry, to further develop it, to improve it, to make full use of the available opportunities, to spread the achieved successes widely, and to study the cause of the shortcomings and help to eliminate them as much as possible. includes the following:

• to study the cause of the achievements and shortcomings based on accounting and statistical reports;

• to study the comprehensive activities of enterprises, the level and pace of economic development;

• development and implementation of measures - activities that help the development of disadvantaged enterprises by comparing the performance of low-performing gold mining enterprises with the indicators of advanced enterprises, relying on their experience;

• at the end of the analysis, study the factors that affected the work results and their causes, make appropriate decisions with changes, etc.

national economy, economic analysis in the gold mining industry is carried out in several ways.

Benchmarking is used in the gold mining industry to determine the effectiveness of the bottom line by analyzing specific and aggregated economic indicators.

Practical experience shows that any enterprise wants to compare its costs with the costs of other enterprises producing similar or homogeneous products in this industry and other activities through different options. The level of profit, cost, investment activity or the "cost-result" system is literally carried out using the method of comparison.

Through the method of fact analysis, it is possible to fully analyze all factors of the economic activity of gold mining enterprises, that is, the final result - profit, price, cost, or the "cost - production process - profit" system. The analysis of facts also makes it possible to prepare the necessary data for the generalization and modeling of many economic processes.

The expert assessment method evaluates the development processes of the gold mining industry with the help of highly qualified specialists, experts (economists, lawyers, managers, engineers, etc.) widely used in evaluating changes.

The method of economic forecasting (forecasting) is the study of the market in the field, that is, prospective planning of production, sales of finished products and the study of the possibilities of effective achievement of the final results, identification of specific problems of economic forecasting and development of the gold mining industry, and makes it possible to develop its scientific solutions.

The method of systematic analysis as a method of scientific research makes it possible to analyze the complex structure of the industry, its inter-industry relations and specific features. Through this method, the development of the gold mining industry, its role in the national economy, its impact on structural changes, goals and tasks are determined step by step . Based on them, a scientific hypothesis is formed and effective directions are determined.

The economic mathematical method is widely used in the research of market structures. Through this method, the existing problems in gold mining industry enterprises are studied and it is expressed in the following models:

• models representing the statistical directions of gold mining industry development;

• modeling of the mining, beneficiation and metallurgical processing industries of the gold mining industry;

• socio-economic models of development of gold mining in the regions;

• modeling of economic and social activity in mining enterprises.

Due to the large-scale application of the economic-mathematical method and modern computing techniques and information tools, the most effective, highly profitable directions in the gold mining industry, the technological possibilities of rational and comprehensive use of mineral raw materials, and the increase of the range of manufactured products directions can be determined.

As a result of the analysis of the management and efficiency improvement issues of gold mining, we found it necessary to emphasize the following:

- Due to the fact that the development processes of inter-sectoral management science are complex and divided into many stages, the scientific works created by foreign and our republican scientists serve as an important basis for bringing the management system to a new level;

- The theoretical and practical aspects of management in the gold mining industry should be studied and analyzed, in our opinion, the directions for increasing the efficiency and development of the industry should be implemented based on world practice;

- The basics of increasing the efficiency of gold mining in Uzbekistan can be brought to new levels as a logical result of the economic reforms being implemented in our country;

- These reforms will create favorable conditions and opportunities for the implementation of economic policy and modern management methods for increasing the efficiency of the gold mining sector.

Thus, the achievement of economic, social, scientific-technical and organizational activities, which have been emphasized to increase the efficiency of

gold mining in our country, is considered a guarantee of the solution of the special goals facing the industry.

Although political, economic and social stability has been established in our country, the situation in neighboring Afghanistan remains very unstable. In such conditions, foreign investors have to work only on investment projects guaranteed by the government.

On August 30, 1995, the Law of the Republic of Uzbekistan on "Concessions" was adopted. According to this law, a foreign investor can acquire the right to own and use land and underground plots in our country on the basis of mutual benefit through selection and auction. Article 17 of the law stipulates that the concession contract shall be concluded for a period of up to 15 years, and if necessary, the term of the contract may be extended in accordance with the decision of the Cabinet of Ministers. The main gold mines operating in our Republic have been mining for more than 40-50 years, including: Muruntov mine since 1967 , Kalmokir mine has been operating since 1959, Chodak mine since 1970, Kuchbulok mine since 1975, Kovuldi mine since 1977, and Zarmiton and Kyzil-olma mines since 1989.

In our opinion, taking into account the characteristics of the mining industry, it would be appropriate to conclude a concession agreement for a period of 25-30 years. During such a period, the foreign investor retains the opportunity to make a positive contribution to the environment of mutual competition between the industry, as well as to effectively carry out the activities in a particular mine.

Therefore, "Concessions" create favorable conditions and opportunities for the development of the gold mining and processing industry.

It is known that , despite the fact that we have some inconveniences to reach the sea ports, today several joint ventures in cooperation with foreign investors on gold mining in our country, including "Zarafshon-Newmont" joint venture The enterprise was operating in the Muruntov Mine.

The joint venture "Omontoytov - Goldfields" also had its production operations in Central Kyzylkum. in 2003, it managed to ship a million tons of ore to mining and processing complexes.

Taking into account the position of the Republic of Uzbekistan in Central Asia, the author made a proposal to establish specially authorized banks that carry out transactions with precious and non-ferrous metals.

For this, we believe that the following actions should be carried out:

- Development of the government's decision and Central Bank's instructions regulating investment activities in the Republic;
- Establishment of a "gold exchange" in the Republic with the participation of commercial banks for transactions with gold coins;
- Determine the required interest rate for exchange services, and mobilize the rest in the direction of modernization and production development of gold mining and processing enterprises, including the establishment of small mining enterprises;
- To export gold bullion coins to foreign countries, to allow them to be used as a guarantee for obtaining loans in foreign currency from local and foreign banks, and to develop procedures for its implementation;
- To create conditions that provide the right to freely sell gold coins in the domestic market and establish their currency regimes under certain conditions or when the investor needs money.

The establishment of the gold market in the Republic of Uzbekistan and its development in accordance with world standards will certainly make an important contribution to the economic development of our country.

III . PROSPECTS FOR DEVELOPMENT OF THE GOLD MINING INDUSTRY IN UZBEKISTAN

3.1. Effectiveness of attracting foreign investments to the gold mining industry of Uzbekistan

The large-scale integration of the independent Republic of Uzbekistan into the world civilization has created legal and organizational conditions for the introduction of foreign investments into our national economy. In addition to conducting an "open door" policy, Uzbekistan opens reliable legal guarantees and wide economic opportunities for foreign investors to engage in business activities in our country.

The most favorable conditions and procedures have been created for foreign investors, and they are constantly being improved from year to year.

The main guarantees given to foreign investors in the current laws are as follows:

First, foreign investments in the Republic of Uzbekistan are not subject to confiscation.

secondly, foreign investors are guaranteed to transfer profits and other funds obtained as a result of legal activities abroad in foreign currency without any restrictions. exchange is provided.

thirdly, foreign individuals and legal entities are guaranteed free participation in the process of privatization of state property, including real estate transactions.

fourthly, enterprises established with the participation of foreign investments can take property without paying duty to export their own products without a license and import products for their own production needs, as well as to contribute to the authorized fund of joint ventures. has the right to enter.

Current laws provide guarantees for foreign investors as well as wide tax incentives.

In order to provide assistance to foreign investors, a network of specialized organizations and institutions has been established in Uzbekistan. These include the Agency for Foreign Investments, the Chamber of Manufacturers and Entrepreneurs, the National Export-Import Insurance Company "Uzbekinvest" and others. Foreign investments are protected by reliable insurance.

World experience shows that investments aimed at the development of minerals with a high level of liquidity bring high returns.

The world's leading foreign companies and firms actively participated in these directions:

1. In 1992, the Uzbek-American joint venture "Zarafshon-Newmont" on gold mining was established. The founder of the enterprise is the American company "Newmont Mining Corporation". This joint venture was established in order to extract gold from the mineralized heap of Muruntov mine tailings. Construction of the $220 million plant began in October 1993 and was completed in 18 months in May 1995. According to the signed contract, the share of foreign partners in the project was 50%, and the average content of overburden in the vicinity of the Muruntov mine was 1.4 g/t. 220 million tons of gold-bearing ores were involved in re-production. In 1995, the joint venture produced the first series of gold. The plant's design capacity for ore was 13.8 million tons and was intended to produce 12-12.5 tons of gold per year.

The production technological processes of the enterprise are as follows: the ores in the overturning are pushed to the D 992 front loading machines using three D 10L bulldozers. They load the ores into the receiving hopper of the "Nordberg 160" crusher, and the ores are crushed to 150 mm and delivered to the buffer warehouse by conveying conveyors. From the warehouse, ores are passed through 4-stage crushers and their size is crushed to 3-3.5 mm. Cement, lime and water are added to crushed ores and placed on conveyors in a batch selective smelting (kuchnoye vishelachivaniye) platform. The lower part of the field is leveled and 300 mm thick soil is laid to make it impermeable. After that, a polyethylene film is placed on it and crushed ore is laid in a layer of several

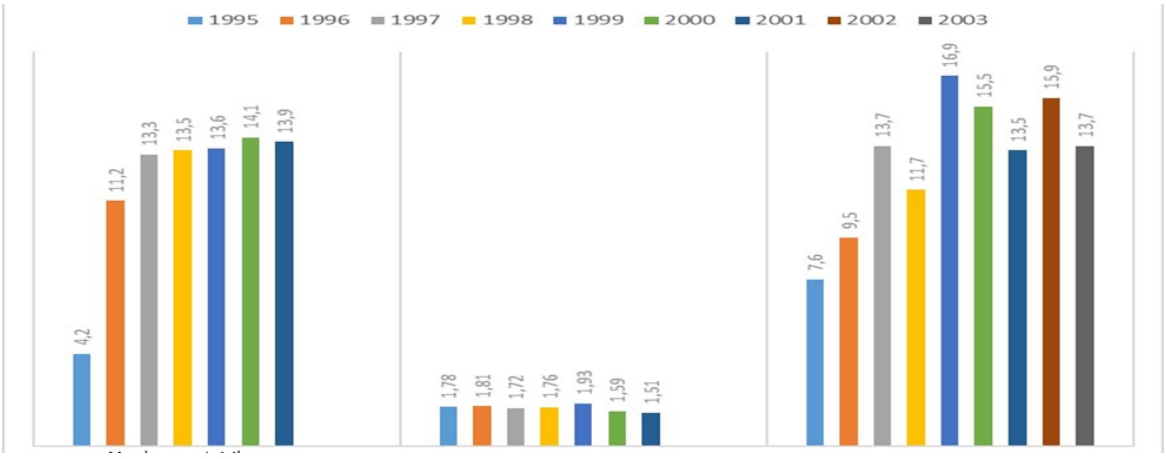
centimeters. Drainage pipes with a diameter of 100 mm are laid on this layer, and their three parts are connected to the drainage collector pipes with a diameter of 450 mm, passing through the side of the field. The thickness of 600mm of 50mm-sized rocks spread over the pipes is the main drainage shell and protects the entire drainage system from damage to the equipment and mechanisms working on the site.

For selective smelting, ores are deposited 10 meters thick and form one layer. When the number of layers is 8, its height is 80 meters and its width is several hundreds of meters. Solvent solutions to the top of the ores in the layer are continuously absorbed through pipes to an area of up to 500,000 square meters with the help of drip emitters arranged in a grid of 600x600. As the solution seeps through the 10-meter layer, it dissolves the gold in the ore and flows through the drainage pipes below to the collection ponds (reservoirs). In the ponds, sodium cyanide is added to this solution to ensure effective extraction of gold, and it is again directed towards the upper layer of ores. Extraction of gold is carried out in the "Merrill-Crow" machine by the method of spirit precipitation. The solution is passed through filters, from which oxygen and carbon dioxide gases are removed in the process of vacuum deaeration. After that, spirit dust and lead nitrate are added to the solution, as a result of which gold and other metals are precipitated with the spirit. These precipitates are collected in five filter presses, and the solution is sent back to the upper layers to dissolve the ores . In this way, the extraction cycle is repeated.

The precipitate obtained is heated in two furnaces at a temperature of 650°C for oxidation of base metals. The heated precipitate is mixed with flux and melted in a furnace. During the smelting process, oxidized metals turn into slag. And the gold is combined with each other and collected at the bottom of the melting pot under the influence of its own weight. After melting, first slag is poured from the crucible, and then gold. The gold in the final mixture from the smelting contains 10% silver, 5% copper, 2-3% lead and around 2% primis. From this mixture, pure gold with a purity of 99.99 is produced in the form of ingots at

the hydrometallurgical plant GM3-2 belonging to the Navoi Mine Metallurgical Combine. The production indicators of the joint enterprise "Zarafshon-Newmont" are shown in the table below.

Gold production indicators of the Uzbek-American joint venture "Zarafshon-Newmont". Table 3.1.



Pryamie investitsii i krediti - pokazatel doveriya "Pravda Vostoka" newspaper. February 9 , 2002. Created on the basis of the information of Zarafshan - Newmont» Uzbekistan - American joint venture.

Although the Uzbek-American joint venture " Zarafshon- Newmont" has finished its work, it is possible to bring new technological processes to the country, apply them and significantly increase production efficiency. proved itself in practical activity.

2. "Zarispark" enterprise, which produces jewelry, was established in the Navoi mine metallurgical combine together with the American company "Yevrotrade International LTD". was completed and launched.

This enterprise produces more than 400 types of jewelry and jewelry of 585 samples in the volume of 7.7 tons per year. These jewelry are of high quality and competitive price and are in high demand in domestic and foreign markets.

Today, all investments made in this enterprise have fully paid for themselves, and the enterprise is working at full capacity at the disposal of the Navoi Mining and Metallurgical Combine, and at the same time, it supplies the domestic and foreign markets with high-quality jewelry.

It should be noted that the total amount of gold mined by mankind is estimated at 140,000 tons, and more than 40% of it is jewelry. Today, the demand

for jewelry is increasing in various regions of the world, including the Middle East, India, Western Europe and Asia. In our opinion, expanding the production of high-quality gold jewelry, various types of jewelry and decorative items produced in our Republic is of incomparable importance in the development of our national economy. In this direction, we believe that it is an urgent issue to establish the production of high-quality, competitive jewelry in Almalyk KMK, as well as in Navoi KMK.

In 1994, the Uzbek-British joint venture "Omontoytov Goldfields" was established. The founders of the joint venture are Oxus Company (Great Britain), Navoi KMK and the State Geological Committee of the Republic. The purpose of this joint venture is to gradually develop the gold-sulphide deposits "Omontovtoy", "Osovgok", "Sariqbotir", "Visokovoltnoye" and "Uzunbulok".

In the first stage of this project, the oxidized ores of the mines will be involved in open-pit mining, and the processing will be carried out by selective smelting , and in the second stage, the sulphide ores of the mines will be involved in the mining and their processing will be carried out in hydrometallurgical plants. In accordance with the plan of the first phase of the project, in the first quarter of 2003, the joint venture reached the first million tons of ore mining capacity.

Considering the limited financial resources in both the state and the private sector, it is necessary to emphasize the importance of increasing attention to foreign investments and the rational use of leasing services in connection with the problem of financing gold mining enterprises in the conditions of the market economy, equipping them with new equipment and technologies.

Leasing (financial lease) is acting as a new direction of production financing. If the average term of bank loans is 1-2 years, leasing loans can be up to 15 years, depending on the adopted technologies.

Its advantages are expressed in the following:

collateral obligations of leasing agreements compared to credit organizations are 2-3 times less and there is a possibility of late payment of lease payments, taking into account the profile of the leasing company, the price of the

agreement agreement for small enterprises is reduced by 15-20%; due to the inclusion of lease payments in the cost of the taxable base, the existence of advantages in the allocation of VAT payments to the budget.

It can be noted that effective use of existing internal and external funding opportunities for modernization of gold mining and production enterprises, equipping them with modern equipment and technologies will definitely make a significant contribution to the development of the industry.

Another example is Uzbekistan, in addition to carrying out practical work on the development of gold ore deposits of the Tashkent zone between the companies "Newmont Maying Corporation" (USA) and "Mitsui" (Japan), in two promising fields in Karakalpakstan. search was conducted.

The above examples show that we have a wide range of opportunities for mutually beneficial cooperation in the field of development of natural resources of the Republic with foreign companies.

The above-mentioned examples of such cooperation once again prove that the implementation of such projects is of high interest to foreign investors.

Thus, the analysis of the work carried out to attract foreign investments to the gold mining industry in the years after the independence of our country allows us to draw the following conclusions:

1. As the Uzbek-US joint venture "Zarafshon-Newmont" launched gold production from the tailings of the Muruntov mine, the introduction of technological lines aimed at obtaining non-ferrous metals in the tailings around the "Kalmokir" mine in Almalyk would be appropriate;

2. It is proposed to introduce the production of jewelry, various types of jewelry, decorative items at "Almaliq KMK" JSC from high-quality gold produced in our republic;

3. It is necessary to make full use of all the legal, financial conditions and opportunities created in order to increase the effectiveness of attracting foreign investors in the direction of modernizing the gold mining industry enterprises of

our country in terms of "green ecology", arming them with new techniques and technologies. .

3.2. Ways of development and improvement of the gold mining industry in Uzbekistan

According to the decision of the Cabinet of Ministers of the Republic of Uzbekistan "Measures to improve the management structure of the gold mining industry of the Republic of Uzbekistan" No. 145 of 2002, the main gold mines belonging to the association " Ozolmosoltin" are " Almalyk MMC " and "Navoiy KMK" JSC was merged with enterprises.

The integration of these mines into two large industrial enterprises has opened up enough opportunities for the existing gold extraction plants to operate at full capacity, as well as directly linking the underground and open pit ore mining processes. Also, in the direction of integrated use of minerals, it created conditions for solving the urgent issue of organizing waste-free production in exchange for arming the operation of existing factories with new modern technological lines.

As mentioned, the main gold-producing mines are located in the western and eastern flanks of Uzbekistan. We will consider the prospects for the future development of the gold production industry in our republic until 2040. In Western Uzbekistan, it looks like this:

In accordance with the decision of the Cabinet of Ministers of the Republic of Uzbekistan, a technical and economic project for the production of gold-containing ores in the "Dovgistov" and "Kokpatas" mines belonging to JSC "Navoiy KMK" based on the "Dzhenkor" technology of the Republic of Uzbekistan was developed. Its main concepts are:

- beneficiation of mined ores is carried out in the mines themselves, and processing is carried out in the 3rd hydrometallurgical plant;
- due to the use of new modern computer technologies in the mines, the work of opening the upper layer will be reduced by 35-40%, and the related costs will be reduced;

- 3 - the ores brought to the hydrometallurgical plant for processing are sorted according to useful components during the mining process, avoiding the transportation of unnecessary rocks to the plant;
- 3 - modern bacterial technology is applied to oxidized ores mined during processing at the hydrometallurgical plant.

During the processing of oxidized ores of the "Kokpatas" and "Dovgistov" mines, the specialists of NMMC and "Integra Group" (USA) developed a mixed ore sorting technology, according to which 50% oxidized ores were extracted from the ores at the 3rd hydrometametallurgical plant.

In order to speed up gold mining in the "Zarmitan" and "Marjonbuloq" mines, a tender was announced for the establishment of a joint venture with the participation of foreign companies. The world's leading gold mining companies "Kilborn", "Kameco" (Canada), BSG - Betman (JAR), Maltinlex Mining (Australia) and others were invited to participate in the competition.

In order to increase the weight of gold production, a program for the development of gold production until 2030-2035 and 2040 is being developed at "Navoiy KMK". The goal of the program is to ensure the continuation of the currently achieved results in the period up to 2040 and beyond, to increase the weight of gold production and to maintain it in a steady state in the future. According to it, the 2nd hydrometallurgical plant will be expanded and partially renovated during 2030, and then by 2040 its processing capacity will be 40 million tons.

In the "Muruntov" mine, the transportation scheme was renovated in connection with the modernization of cyclic-continuous technology. Profitable extraction of the gold reserves of this quarry in open and open-pit methods will provide the 2nd hydrometallurgical plant with raw materials continuously even after 2040.

4-5 million tons of oxidized ores from the Dovgistov mine in 2030-2040 in the 1st stage of the joint processing of gold sulfide ores of the "Dovgistov" and "Kokpatas" mines under the "Uchguduk gold extraction complex" 3-

hydrometallurgy processed in the factory. For the plant to work at full capacity, mixed ores from Kokpatas are brought in for processing.

In the 2nd stage, in 2035, the ore processing complexes will be launched at the "Kokpatas" and "Dovgistov" mines, and the gold production will be doubled due to the processing of gold-sulfide enriched ores at the 3rd hydrometallurgical plant.

3rd stage, the 3rd hydrometallurgical plant will reach its design capacity by 2027 and re-produce 7 million tons of enriched ores per year. Gold production in the Uchkuduq gold extraction complex will increase 3.7 times from 2020 to 2040.

In 2030, it is planned to increase the production of oxidized ores to 560,000 tons at the "Marjonbuloq" gold mine. Oxidized ore reserves will supply the factory until 2010. In the future, the factory's activity will be mobilized for re-production to obtain gravity enrichment from sulphide-arsenic ores.

By 2030, underground and open-pit mining of "Zarmitan" gold mine will amount to 500,000 tons. Here, the share of the underground method is 350,000 tons.

The "Karakoton" mine operates as a raw material base for the 1st hydrometallurgical plant of "Navoiy KMK" JSC. Ore production at this mine will reach 100,000 tons by 2030, and its capacity will almost double to 200,000 tons by 2040.

Thus, the development program implemented in "Navoiy KMK" will increase gold production by 30-40% by 2040. Also, the following directions can be noted in the future activities of "Navoiy KMK" according to the program:

- Maintenance of high capacities and continuity of production in Zarafshon gold extraction complex;
- 2 - to increase the production capacity at the hydrometallurgical plant due to the processing of unbalanced ores;

- Due to the deepening of the "Muruntov" mine, due to the construction of the 4th stage of the quarry, increasing the efficiency of mining operations and attracting other small-scale gold mines to production;
- Involvement of mineralized heaps in the "Muruntov" mine overturnings for re-production in exchange for the use of new technological methods. The volume of these transfers is 1 billion. more than tons, the amount of gold in them is recorded at around 500 tons;
- In return for the gradual production of gold sulfide ores in the "Kokpatas" and "Dovgistov" mines, it includes increasing the weight of gold production in the "Uchguduq gold extraction complex" and others;

As stated in President Shavkat Mirziyoyev's 2023 address to the Oliy Majlis and the people of Uzbekistan, the construction of a 4 million ton gold ore processing complex will be completed this year in the Pistali mine of Navoi region. As it was noted in the meeting of the video selector under his chairmanship on September 8, 2023, dedicated to the discussion of the work being carried out in the sector and regions for the stable operation of industrial enterprises, an additional 840 billion so will be allocated by the end of 2023 due to the premature start-up of a new metallurgical plant at the "Pistali" gold mine. m product is produced.

Gazeta.uz of the Geological Committee of the Republic of Uzbekistan. According to the information given to "Chukurquduq" gold mine in Kyzylkum, the reserve of which is 133 tons, was taken into the state reserve. The proven reserve can be estimated at 7.55 billion dollars, taking into account the current market conditions. The price of gold in the post-pandemic conditions averaged $1,771 per troy ounce on global markets.

The gold mines located in the eastern part of our republic and their development prospects are expressed in the following:

Based on technical and economic calculations using advanced practices and high-performance equipment, Almalyk KMK plans to expand production and improve product quality in order to develop in the future. A new development program was developed.

and modern equipment in the production, and took a place in the program of measures to improve the environmental situation in the Tashkent region. Development prospects of the main gold mining mines are shown in the following:

- Mining of ores at the Angren gold mine is being carried out at the "Kochbulok" and "Kizilolma" mines. Today, in the "Kizilolma" mine, mining capital works are being carried out to open the horizons of 925, 985 and 1045 m. As a result of these works, the production capacity of the mine will increase from 250,000 tons to 350,000 tons.

In addition, the gold extraction plant is being renovated to increase its processing capacity from 450,000 tons to 600,000 tons.

- Gold mining in the Chodak mining department is carried out in the "Pirmirob" and "Gozaksoy" mines. According to the development program of this mine, by 2030, the volume of ore extraction and processing is expected to reach 200,000 tons for the factory to operate at full capacity.

As the main direction of achieving this, along with the work of opening and preparation for mining of ores in two sections of the mine, work is being done to replace the existing outdated machines with new ones;

- Mining operations in the Kovaldi gold mine are mainly carried out underground and partly open pit. In the direction of the future prospects of the mine, mining-capital works are being carried out to prepare the gold reserves of the "Yoshlik-2" mine for mining. Involvement of this mine in production creates an opportunity to bring the mining and processing capacities of the Kovuldi gold mine to the design level:

- Construction of a crushing conveyor structure in 2030 at the "Kalmokir" non-ferrous metal mining mine has been recognized. As a result, the cost of existing vehicles will be reduced, productivity will increase, and an additional ten million tons of non-ferrous and precious metal ores will be mined per year .

As stated in President Shavkat Mirziyoyev's 2023 address to the Oliy Majlis and the people of Uzbekistan, the first stage of the development of the

"Yoshlik-1" non-ferrous metal mine will be completed and the 3rd copper beneficiation factory with the capacity to process 60 million tons of ores will be launched. Through this, the ore processing capacity of " Almalyk MMC " will be increased from the current 40 million tons to 100 million tons. In addition to this project, the construction of the 4th copper beneficiation plant and the construction of the copper smelting plant will also be launched.

In addition, the "Chinarsoy" mine was discovered in the Surkhandarya region. These polymetallic ores contain lead. zinc gold and silver are available. In the future, the launch of this mine will create new technologies, new jobs, and the opportunity to attract young people to work.

Another direction is to expand industrial cooperation in the combine and produce products that replace imports. In 2023, the "Almaliq" mining and metallurgical combine established cooperation with local industrial enterprises and started the production of products worth 1 trillion soums, such as polymer, cast spare parts, and chemical reagents. The big programs implemented in the field of metallurgy will allow us to increase copper production by 3 times, and gold production by 150 tons in our country after five years, i.e. after 2028. It should be noted that the share of gold and other non-ferrous metals in the export potential of our Republic is increasing year by year.

For example, 687 tons of Uzbek gold were exported to world markets in the last ten years, i.e. 2010-2020. And in 2022, 100 tons of gold was exported and 5.8 billion dollars came to the state treasury - this was 38.4% of the total exported goods, services and products in the Republic. Gold worth 6.87 billion dollars was sold in January-October of this year. This is 33.6 percent of total exports. In turn, gold exports increased by 2.3 times compared to the corresponding period of 2022. For information, 4.1 billion dollars worth of gold was sold in 2022, 4.1 billion dollars in 2021, 5.8 billion dollars in 2020, and 4.9 billion dollars in 2019.

At this point, if we turn to the gold-currency reserves of our country, it is as follows: according to the data of the Central Bank, the gold-currency reserves of Uzbekistan decreased for the fifth month in a row by September 2023 from the

beginning of the year. As of September 1, the official reserves of Uzbekistan amounted to 32.7 billion dollars. This is the lowest indicator recorded since the beginning of this year. Reserves decreased by almost 958 million dollars compared to last month, and by 3 billion dollars since the beginning of the year. In August, the gold-currency reserves of Uzbekistan decreased by almost 1 billion dollars, and by 3.1 billion dollars since the beginning of the year. This is happening against the background of an increase in the foreign trade deficit, a decrease in remittances, and a devaluation of the national currency. During the reporting period, the physical volume of gold increased from 11.8 million troy ounces to 12.1 million troy ounces, and its value increased from $23 billion to $23.4 billion. Foreign currency reserves in reserve assets decreased from 9.5 billion dollars to 8.7 billion dollars. The amount of foreign currency assets of Uzbekistan has never been so low since 2018, when statistics began to be published. During 2012-2023, the dynamics of changes in gold and currency reserves of Uzbekistan based on the data of the Central Bank:

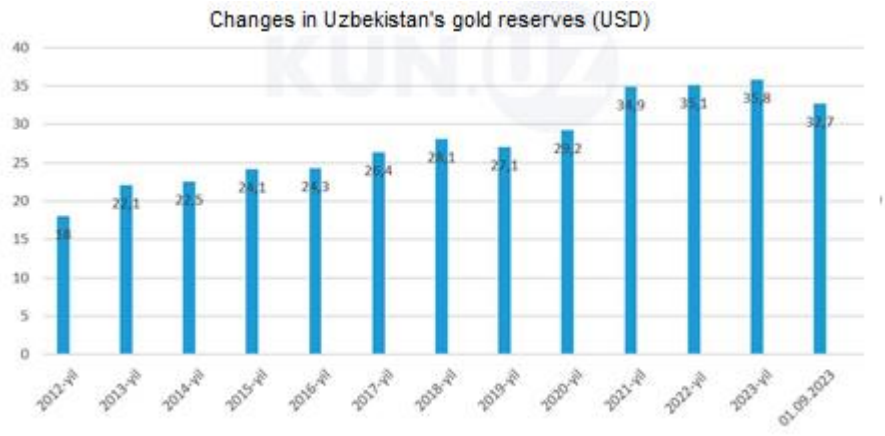


Fig. 3.4. The dynamics of changes in the state's international reserves.

A natural question arises as to why gold and currency reserves are shrinking ? The answer can be found below.

1 . Foreign trade deficit . The foreign trade turnover in January-July 2023 reached 35 billion dollars (the volume of exports was 14.9 billion dollars, and the volume of imports was 20 billion dollars), and the negative balance of foreign trade reached 5 billion dollars. Higher imports than exports require additional foreign currency and

put pressure on the national exchange rate. In particular, a 7.2-fold increase in natural gas imports in the first half of the year may have affected the amount of reserve assets.

2. Reduction of money transfers . The amount of cross-border transfers made to Uzbekistan in the first half of this year was 5.2 billion dollars. This figure was 6.5 billion dollars in the corresponding period of last year. That is, a 20 percent decrease was observed in money transfers.

3. Depreciation of the national currency rate . Since the beginning of this year, the Uzbek soum has depreciated by 9.3% (from 11,146 soums to 12,300 soums) against the US dollar against the background of fluctuations in the exchange rate of the main trade partner countries. In order to prevent sudden changes in the exchange rate, the Central Bank may have implemented currency interventions in the domestic market. Since the beginning of the year, Uzbekistan's reserve assets have decreased by $3.08 billion, including foreign currency reserves by $2.94 billion.

In fact, the answer to the question of why gold and currency reserves are needed for our economy can be found in the following.

1. Gold-currency reserves of each country are a kind of insurance. It protects the country's national economy from possible macroeconomic risks. Therefore, gold and currency reserves must meet a number of requirements. For example, it should be possible to use it in any field. Gold-currency reserves should be easy to place and easy to get. Gold and currency reserves of countries can be used for the following purposes:

to eliminate the deficit in the balance of payments and trade;

inflation , to buy foreign currency to support the national currency in the financial market;

to pay the foreign debts of the state;

to make settlements between countries.

2. Gold-currency reserves mainly consist of precious metals (bulk gold, platinum, palladium, silver), foreign monetary instruments recognized as reserve currencies at the international level (US dollar, euro, Swiss franc, Japanese yen, pound sterling)

and the International Monetary Fund It consists of non-cash monetary units issued by the Army.

3. The amount of gold and currency reserves of the state indicates the state of its economy and financial system, guarantees the timely implementation of payments on interstate obligations. According to the recommendations of international organizations, reserves for developing countries should cover at least 3 months of imports.

That is why, in paragraph 47 of Annex 1 to the Decree PF-158 "Uzbekistan - 2030" strategy adopted by the President on September 11, 2023, in the direction of effective use of the local raw material base and development of industry based on advanced technologies. it was decided to increase the share of manufactured technological products from 25 percent to 32 percent. For this purpose, it is envisaged to increase copper production by 3.5 times, gold by 1.5 times, silver by 3 times, and uranium production by 3 times.

In July 2022, President Shavkat Mirziyoyev signed a decision to increase the volume of uranium mining and processing in 2022-2030. It states that the Republic of Uzbekistan plans to double the volume of uranium mining in 2022-2030. In particular, it is planned to increase the production volume from 3,526 tons in 2021 to 7,100 tons in 2030.

In 2022-2030, due to the activation of geological research, the indicators of the rate of growth of uranium reserves were approved, and it was planned to increase from 4,700 tons to 10,500 tons per year. With the document, a list of 20 investment projects with a total value of 460 million dollars to increase uranium mining in the republic was approved. At the same time, in the strategy of Uzbekistan - 2030, it was determined to increase the production of uranium in the country by 3 times within seven years.

A number of investment projects have been launched since 2018 in the direction of attracting new mines to production in our country under these huge milestones. As we mentioned above, the big programs implemented in the field of mining and metallurgy will make it possible to increase copper production by 3

times, and gold production by 150 tons in our country after five years, that is, after 2028.

Fig. 3.5 Gold bars

The opening ceremony of Balpantog and Tomdibuloq mines as part of the Muruntov mine was held in the territory of Tomdi district of Navoi region, and the first blasting operations were carried out here. 3 million tons of gold-rich ore will be mined from the Balpantog and Tomdibulok mines for 15 years. To carry out these works, it is planned to buy 7 hydraulic excavators, 5 drilling rigs, 23 trucks, 2 locomotives and many other mining equipment.

For this purpose, a mining enterprise will be established here. Gold ore reserves of the new mines will be transported to the 2nd hydrometallurgical plant of the combine through 33 kilometers of railways.

As a result of the operation of these mines, 653 new jobs will be created.

CONCLUSION

From the results of the work, it can be concluded that the acceleration of mining operations in all gold mining enterprises in our Republic, the introduction of new high-performance technologies in production, the management of production at the level of modern requirements - the operation of existing processing plants and

factories at full capacity. to provide, our Republic is creating a solid ground for showing its positive influence on the development of the gold industry, as well as on the growth of our national economy.

In this direction, we believe that the main attention should be paid to the following:

The world practice and the accumulated experiences in the mining sector of our country show that labor productivity in open-pit works is several times higher than in underground works;

Factors such as the presence of non-ferrous and rare metals and other mineralogical components in mined ores have a significant impact on labor productivity;

Increasing production productivity depends on the composition and technical level of labor tools, the introduction of advanced technological processes in production;

Mechanization of the rock mining process, perfecting the efficient use of high-performance equipment and vehicles are among the urgent tasks facing the industry. The rise of techniques and technologies and the development of techniques require the appropriate reorganization of production;

Internal production factors of the gold mining industry are related to the technical and organizational level of production, the production and economic activity of all enterprises, the economy of material and energy resources, the growth of labor productivity, the effective use of production capacities, fixed assets, labor, production It is directly related to the improvement of production and management organization, the saving of expenses related to production service and management, and the elimination of costs and expenses not related to production.

In non-ferrous metallurgy, the product cost is determined by the consumption of raw materials and basic materials. In this case, the cost of raw materials is 50-70% of the total cost of production. It is known from practice that the volume of manufactured products is affected by changes in the amount of metals in mined ores or their extraction level.

The costs of auxiliary materials, fuel, electricity included in the cost of the product are on average 10-15% for all non-ferrous metallurgy. But in some sectors, the listed cost caps are much higher, for example, these figures are equal to 40% of the total cost in the beneficiation industry, and up to 55% in metallurgy. The reduction of costs on these indicators leads to a significant increase in economic efficiency.

Reduction of workshop, general factory and other costs, which make up 15-30% of the total cost, will inevitably give a certain positive result in reducing the cost of the product.

The geographical location of the enterprise is important in reducing the cost of production in the mining industry. Therefore, non-ferrous metallurgical enterprises are mainly located around the sources of raw materials. But in some cases, the capacity of mines and factories is not always compatible with each other. This leads to an increase in the cost of transporting rocks and an increase in the cost of metals.

Therefore, the location of the industry close to the sources of raw materials and the reduction of the cost of transportation of raw materials ensures a decrease in the cost of the product.

The development of scientific technology is considered a necessary factor in the development of the gold mining industry, increasing its efficiency, and it acts as an integral part of the system of comprehensive program activities aimed at increasing the efficiency of production.

The main directions of scientific and technical development in gold processing enterprises are as follows:

- application of highly efficient processes in grinding and complete crushing of minerals containing gold rocks during the beneficiation process, further improvement of beneficiation schemes;

mastering new methods of processing gold-containing carbonaceous and other hard-to-enrich rocks;

- development and implementation of new highly effective reagents for flotation in gold extraction process;
- wide and effective use of promising methods of enrichment of gold-bearing ores and sands, including the microbiological method;
- application of modern processing processes and research of their effectiveness in the processing of hard-to-enrich minerals for the purpose of comprehensive use of mineral raw materials.

waste residues generated in the final process of the gold extraction factories occupy a large volume and the waste residues being discharged are increasing year by year.

In China, Australia, Russia, the USA, the Philippines, Mexico, Germany, and a number of other countries, great attention is paid to re-extracting useful components from waste from mixed waste storage areas and using them in the construction materials industry, and for this, developing advanced technologies for their enrichment. is being given.

In this regard, in order to study the possibility of recycling waste, certain scientific research and practical works are being carried out in these areas in all mining and processing enterprises belonging to the "Navoi" and "Almaliq" mining and metallurgical combines, and these scientific works it is necessary to expand its scope, it is necessary to carry out scientific and practical research works and to expand the scope of these scientific works.

Analysis of the activities of the leading countries in the field of gold production (the USA, Canada, Australia, etc.) shows that the experience of giving priority to the organization of small mining enterprises, with their high efficiency, will quickly achieve the intended results. indicates that it is possible.

In our opinion, along with the development of large mining and metallurgical complexes in our Republic, it would be appropriate to establish and support small mining enterprises in each region that can create a base of raw materials. In the establishment of such small extractive enterprises, first of all, it is necessary to make

extensive use of the state approach, lending procedures, incentives, and the mechanisms of attracting non-state funds.

We hope that the implementation of the above-mentioned measures will soon expand the possibility of additional gold and other precious metals production in the Republic and will have a positive effect on the economic development of our country.

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