

Japan International Cooperation Agency (JICA)

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Government of the Kyrgyz Republic
Steering Committee of the Kyrgyz Republic
(Decree of the Government No. 313P)

**MASTER PLAN STUDY
ON
PROMOTION OF MINING INDUSTRY
IN THE KYRGYZ REPUBLIC**

**FINAL REPORT
(SUMMARY)**

October, 1999

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1. Outline of the Investigation

The sphere of investigation objects of Master Plan Study on Promotion of Mining Industry of the Kyrgyz Republic is as follows. Figure 1-2 shows structure and function of governmental bodies on management of mining industry in the time of implementation of investigation. The content of this report is described on the basis of this figure. Further we would like to add that Figure 1-3 is made up as of August 1999.

- | | |
|--|--|
| ① Target Areas Allocation | The whole territory of Kyrgyz Republic |
| ② Task Elements(5 types of ore deposits) | Gold, mercury, antimony, copper, tin |
| ③ Mining combines(5 Complexes) | Kara-Balta, Kadamzhai, *Khaidarkan
Makmal, Solton-Sary (*model combine) |

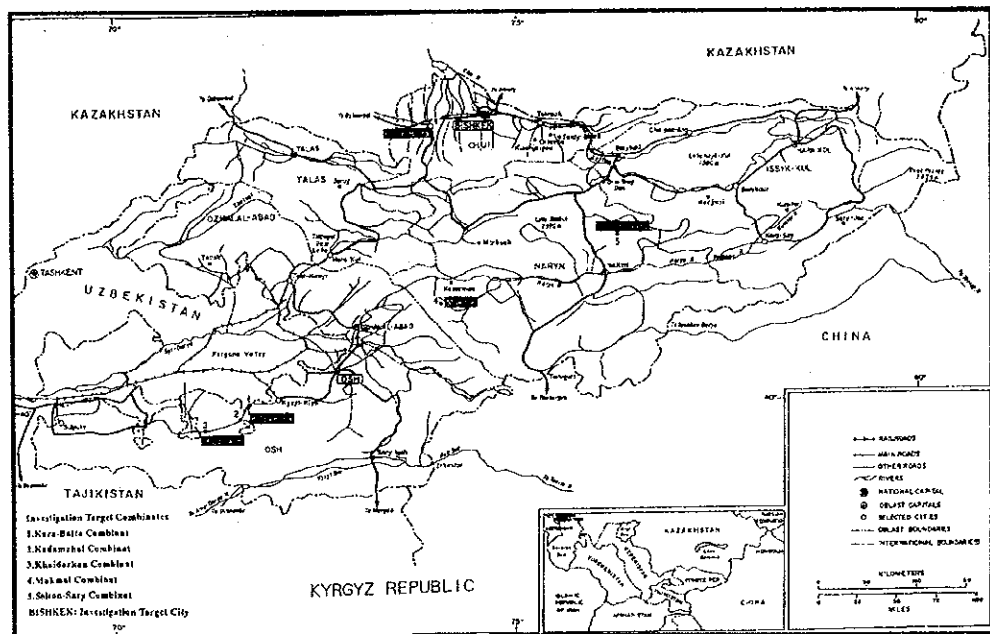


Figure 1-1 Investigation Target Combines and Main Cities

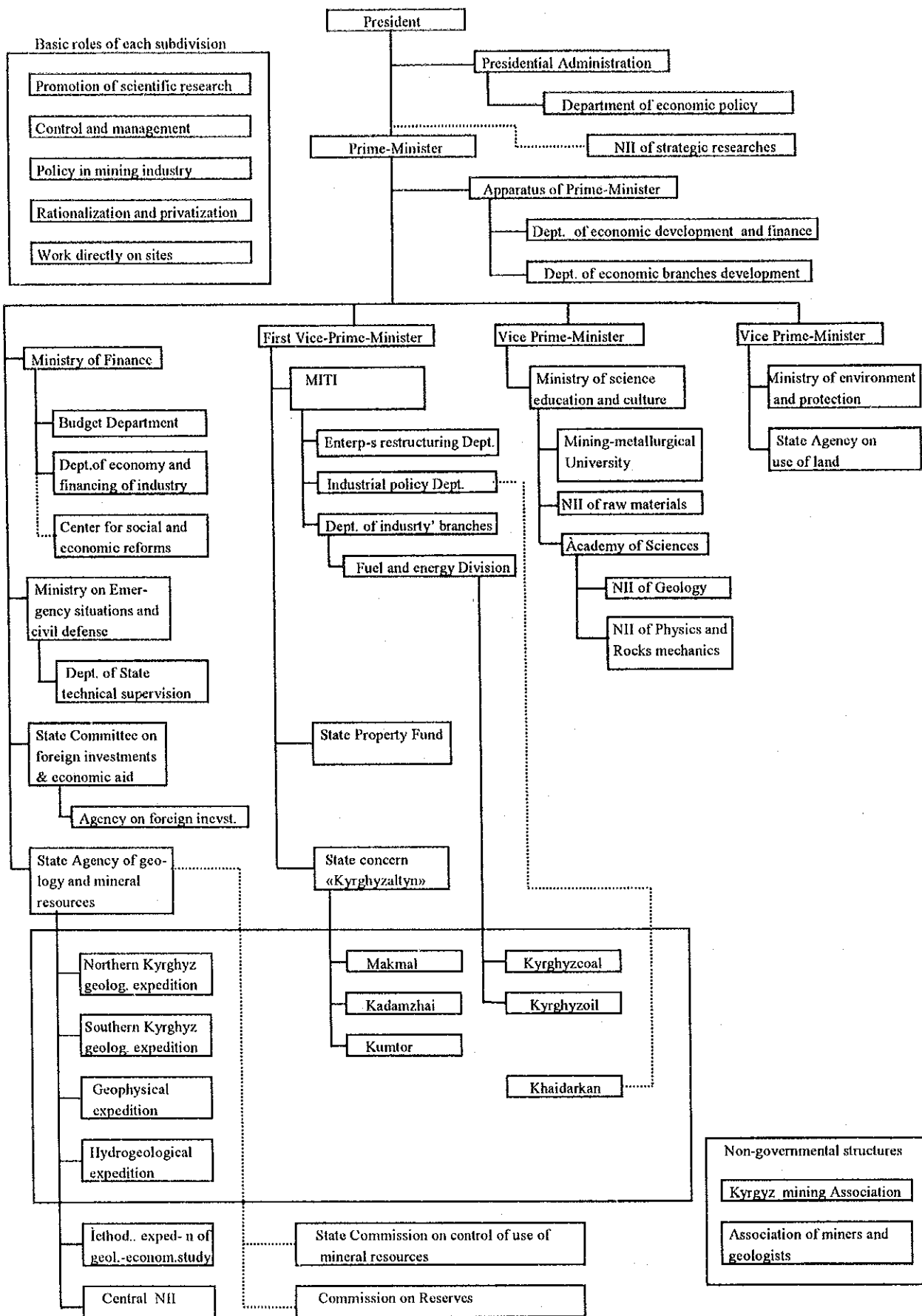


Figure 1-2 System of governmental bodies on management of mining industry Figure (1)

(in the time of implementation of investigation)

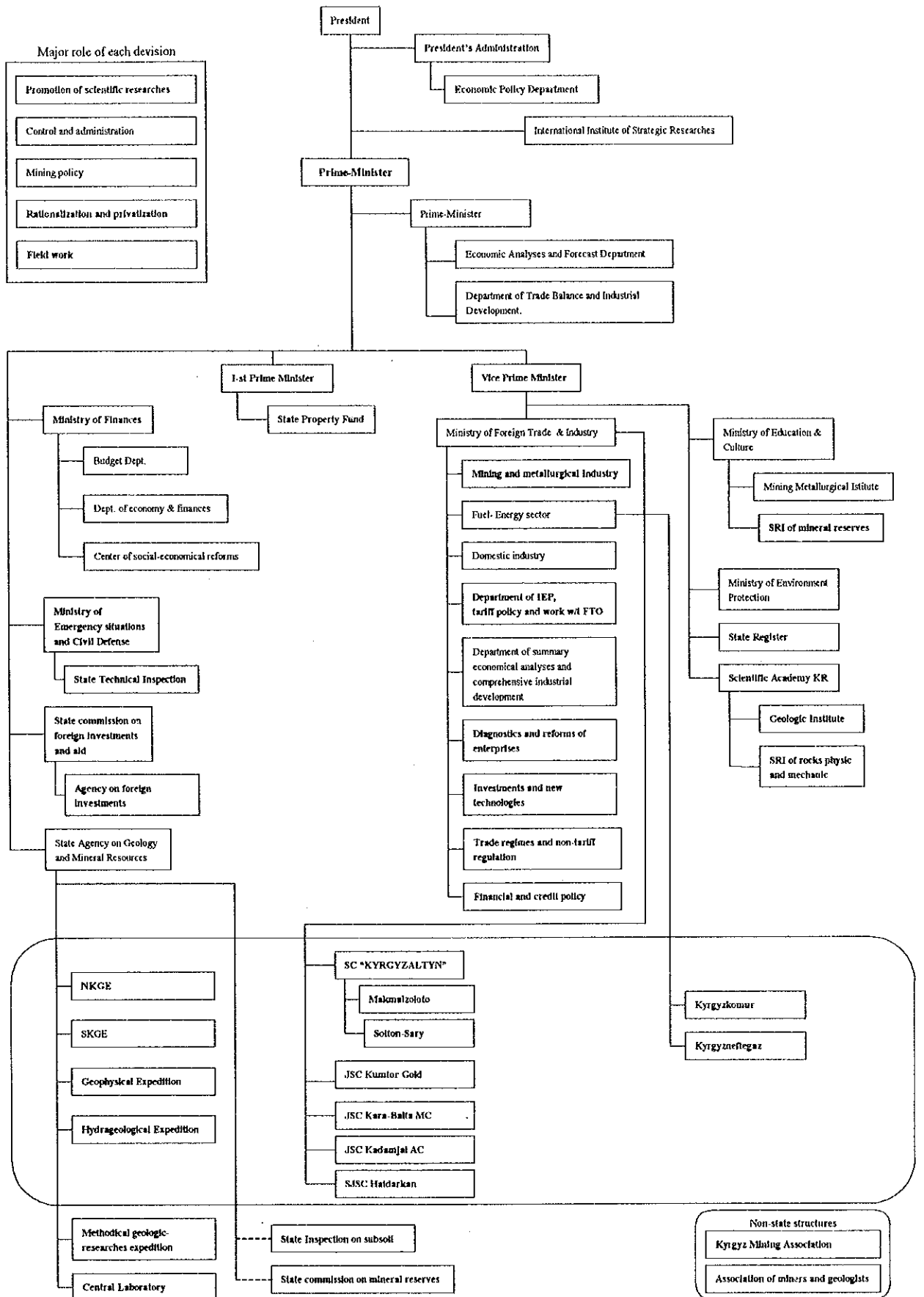


Figure 1-3 System of governmental bodies on management of mining industry Figure (2)
(made up as of August 1999)

2. Present Situation in Mining Industry

2-1 Mineral resources - status

2-1-1 Characteristic features and distribution of ore deposits

1) Gold deposits

Gold-bearing deposits are developed on whole territory of the country. The occurrence of many ore manifestations and mineralization in the deposit neighbourhood imply that one might expect an increase of the total reserves. A number of large deposits with reserves of 70 tons and more are not so big, majority of deposits are middle-size or small (less than 20 tons) ones. Placer deposits are located along the river banks neighboring native deposits (Figure 2-1-1).

Ninety-five gold deposits have been classified and offered by SAGMR. These deposits are classified as lode (45%), mineralized (39%) and stockwork (16%) of which 10% are big deposits (>70tn of Au), 20% medium (20-70tn of Au) and 70% small (<20tn of Au). Correlation of vein and ore minerals shows that there are 40% of gold-quartz deposits and 60% of gold-sulphide ones (Figure 2-1-2).

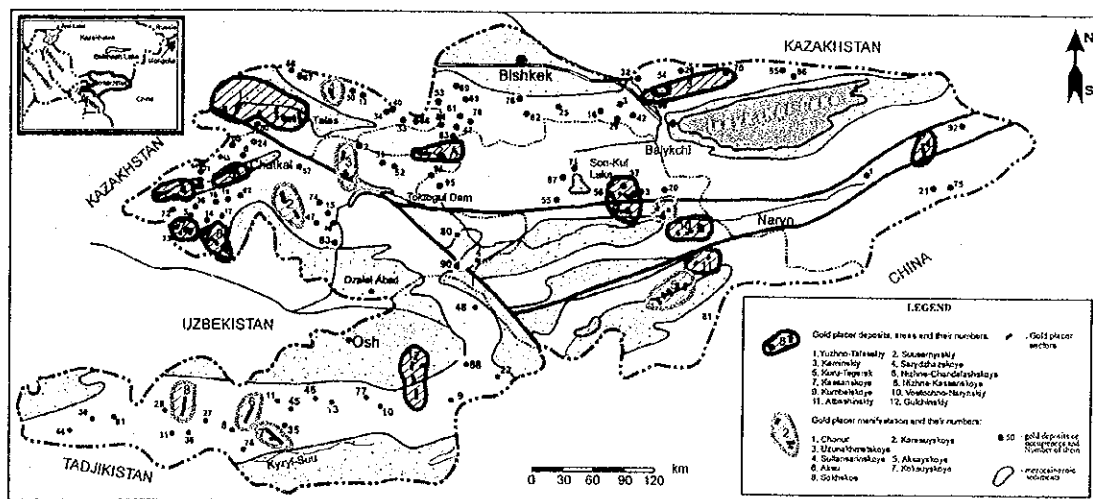


Figure 2-1-1 Distribution of gold-bearing deposits

- Lode type deposits have gold containing quartz veins in metamorphic, sedimentary rocks and granite. They are high grade and comprise more than 10g/t. There prevail small and middle-size deposits (Solton-Sary and others).
- Mineralized zones are developed along the contact of granitoid and limestone, they contain scarn precipitations and widely developed zone of faults, more often they are associated with sulfides (Makmal and others).
- Stockwork deposits: gold is in quartz and calcite stockwork veins of porphyric

type. The grade is low, deposits are large and associated with sulfides (Kumtor and others).

- Deposits in the block of geological structure of Northern Tien-Shan are gold-quartz-vein ones accompanied by copper. In Middle and Southern Tien-Shan they are characterized by the presence of arsenic and antimony (Figure 2-1-3).

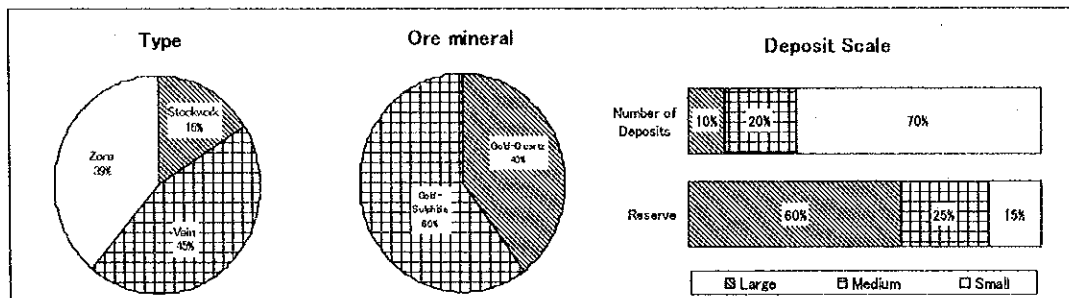


Figure 2-1-2 Gold Deposits Characteristic Classification

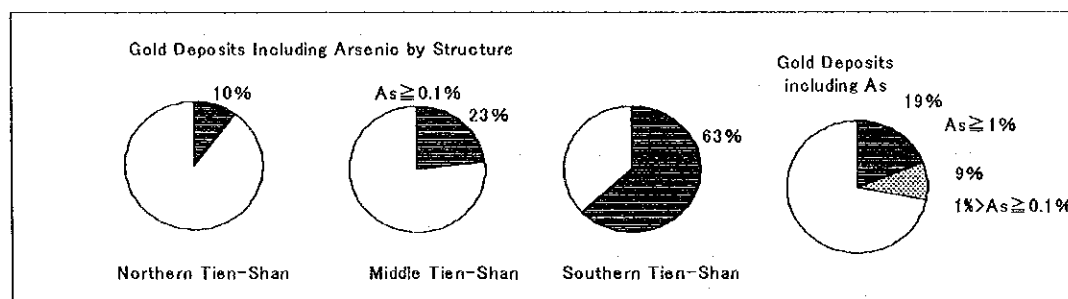


Figure 2-1-3 Portion of Existence of Gold Deposits Including Arsenic in Kyrgyz Republic

2) Deposits of mercury, antimony, copper and tin

- Deposits of mercury and antimony are concentrated and scattered in the zone of Alay mountain ridge in Southern Tien-Shan and form the belt of Hg-Sb deposits. Zone of antimony deposits is located in the Western part of Fergana geological displacement being a part of Middle Tien-Shan.
- Copper deposits in the form of gold-copper deposits are developed in the Western part of Fergana displacement in Northern Tien-Shan.
- Tin deposits are concentrated in Eastern part of Southern Tien-Shan.

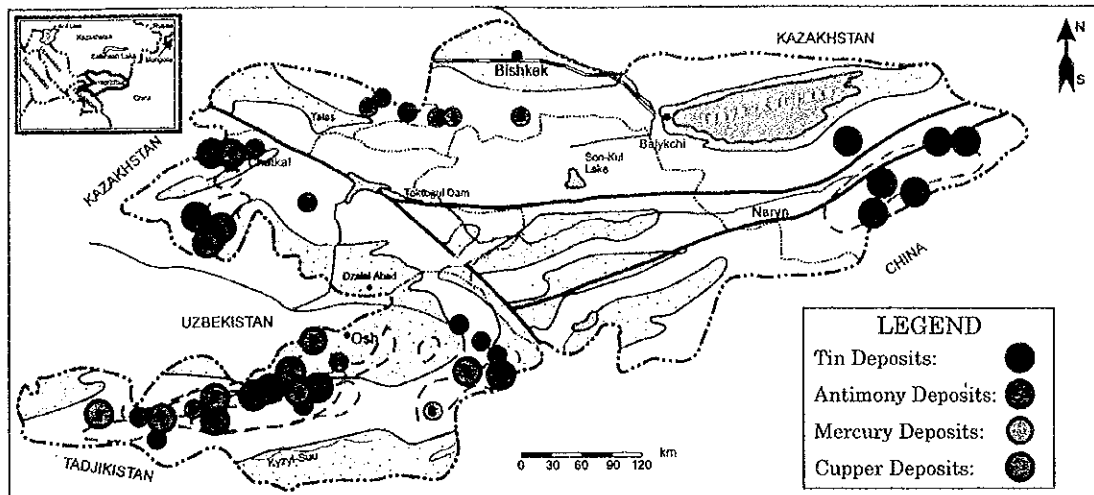


Figure 2-1-4 Distribution of deposits of mercury, antimony, copper and tin

2-1-2 Competitiveness of mineral resources

1) Gold

Gold potential is high, but there are few large deposits. The number of small to middle-size deposits containing complex ores is large, major part of such deposits are subject to underground mining.

Besides that, except Kumtor, Jeruy and Taldy-Bulak Left-Bank, reserves of C1+C2 category are small, the largest part of reserves belongs to P1+P2 category.

Table 2-1-1 Distribution of reserves on categories of deposits
(unit: Au/ton)

name of the deposits	category of reserves			total
	B	C ₁ +C ₂	P ₁ +P ₂	
Kumtor	109	408	201	718
Jerui	-	75	-	75
Taldybulack Levoberezhnyi	-	80	44	124
others	-	334	1,589	1,923
total	109	897	1,834	2,840

According to a rough economic estimation, prospective deposits make up only 10% of the total amount of deposits, another 10% require consideration for their development. The remaining 80% are at the initial stage of ore exploration. There is a lack of data on them, and results of previous estimation need to be reviewed.

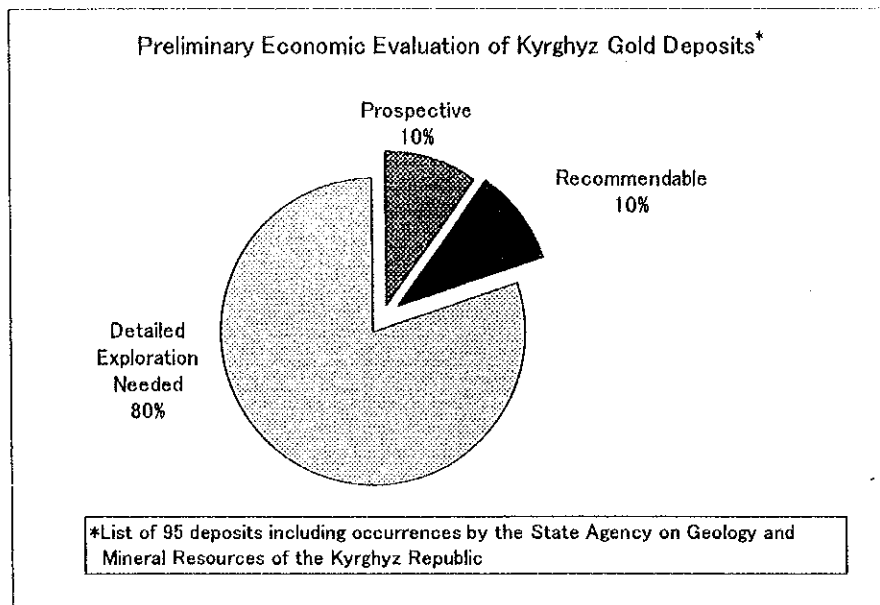


Figure 2-1-5 Gold Deposit Economic Evaluation Results

2) Mercury, antimony, copper, tin

- ① Mercury Main competitor in the mercury market is Spain, percentage content of mercury deposits is very low. Besides that, mining on Khaidarkan deposit transfers to the deep layers, production cost is relatively increasing.
- ② Antimony Overwhelming part of world production of antimony falls on China. In Kyrgyz Republic grade of antimony deposits is low, 1-4%. At the Kadamzhai deposit, a transfer to the lower levels is in the process so mining cost is also increasing.
- ③ Copper Copper deposits are mainly small to middle-size ones. There are no deposits with ores which are suitable for the processing by using SX-EW (Solvent Extraction and Electrowinning) method. In addition, Kyrgyz Republic has no copper smelting facilities and technology, which makes their development difficult.
- ④ Tin Tin deposits are associated with hard rock deposits. Since tin world production is directed toward cheap placer deposits, Kyrgyz tin is uncompetitive.

For better understanding of competitiveness of Kyrgyz mercury, copper, tin and antimony we present re-calculation of deposits of mercury, copper, tin and antimony in the terms of gold grade and reserves (Table 2-1-2). On the Figure 2-1-6 the place of Kyrgyz Republic on mercury reserves and world production of

antimony and tin are shown.

Table 2-1-2 Hg, Cu, Sn, Sb Deposits Au Equivalent Grade & Amount

	No	Deposits	Grade %	Metal	Au conversion *	
					Grade g/t	Au amount, t
Hg	1	Haidarkan	0.200	4,630	1.1	2.70
	2	Chonkoi	0.258	22,698	1.4	13.60
	3	Chauraiy	0.226	875	1.2	0.50
Cu	4	Kurutagerek	0.850	343,200	1.9	82.40
	5	Bozumchak	1.140	203,400	2.6	48.80
Sn	6	Trudovoe	0.580	149,000	3.2	86.80
	7	Uchojgon	0.540	60,700	2.8	3.50
	8	Saribulak	0.930	18,004	5.4	5.80
	9	Atdjolyan	1.970	675	11.5	0.40
Sb	10	Kadamjai	3.170	40,816	6.3	8.50
	11	Tereksai	3.140	23,115	6.2	4.80
	12	Kassanskoe	1.728	60,739	3.4	12.70

* Average 1997 prices of Hg, Cu, Sn, Sb, Au. Reference: Metal Bulletin Price & Data, Mineral Facts and Problems, Mineral Commodity Summaries.

Au 331\$/TOZ, Hg 5.80\$/kg, Cu 238.1¢/kg, Sn 583.005¢/kg, Sb 2.089\$/t

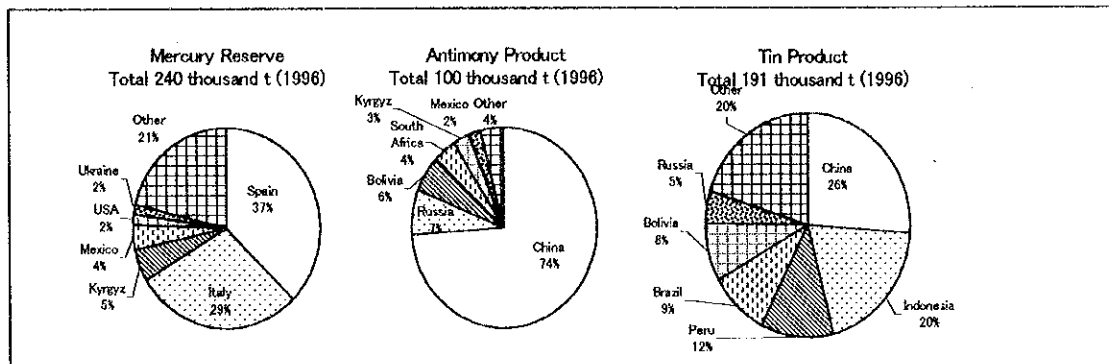


Figure 2-1-6 Reserves and Production of Mercury, Antimony, and Tin in the World

2-2 Situation in geological exploration and development

In Soviet period mining system has included all the stages beginning from the geological survey and ending with development and exploitation of mines. Necessary financing was carried out by the Central Government. After the declaration of independence in 1991, a whole system of labour distribution has been destroyed, financing stopped, and possibility for development of deposits has considerably decreased.

In 1992, the Government established State Concern "Kyrgyzaltyn" and delegated to this organization all the authority for the management of mines producing non-ferrous metals, and development of new mines by attracting foreign capital. At present time all combines, except Makmal, are separated from "Kyrgyzaltyn", and projects of development of large mines at the account of foreign investments such as Taldy-Bulak Left-Bank and Jeruy are suspended, excepting Kumtor.

Existing structure of organizations dealing with geological exploration and development, as well as matters related to mining activity are as follows.

1) Agency on Geology and Mineral Resources

Structure of Agency remained the same as in Soviet times, no any radical structural changes have been implemented (Figure 2-5-2). Financing and personnel of Agency has been reduced (in 1998 2 mln.USD, 2500 people), detailed geological exploration at scale of 1:50 000 is carried out, as well as survey and geological exploration works on gold, oil and coal to the preliminary exploration stage. It is striking that survey and geological exploration equipment and devices in all geological expeditions are obsolete.

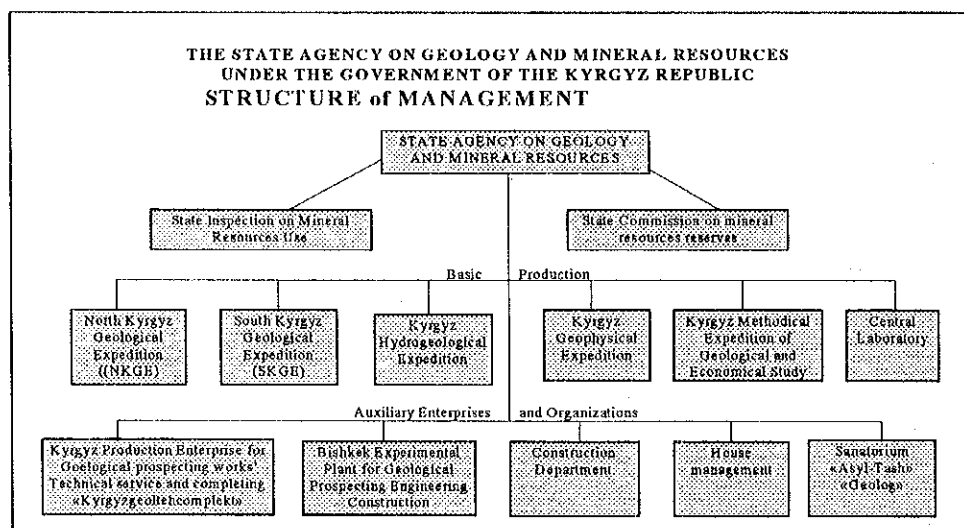


Figure 2-2-1 Structure of State Agency on Geology and Mineral Resources

2) State Concern "Kyrgyzaltyn"

System of State Concern "Kyrgyzaltyn" includes combines Makmal, Solton-Sary, and structure "Tarazaltyn" as well. Besides that, "Kyrgyzaltyn" has enterprises with foreign capital (Figure 2-2-2).

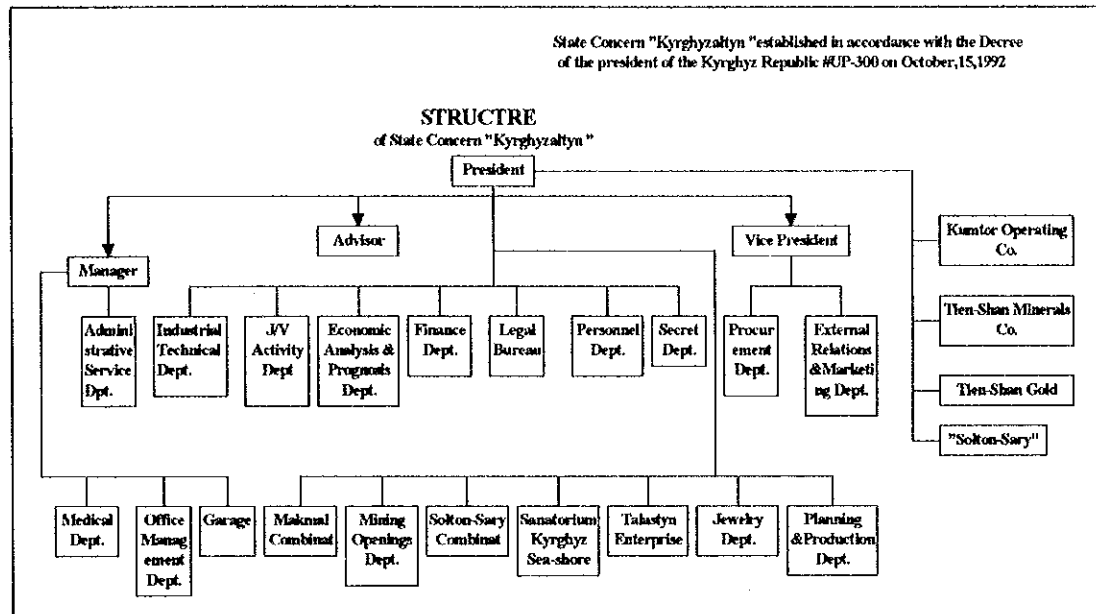


Figure 2-2-2 Kyrgyzaltyn Structure

3) Scientific and research organizations

Evaluation of large-scale projects and determination of prospective areas for geological exploration is performed by the Institute of Physics and Rock Mechanics, Institute of Geology and others.

4) Activity of foreign investors

In Kyrgyz Republic at present time there are approximately 10 foreign companies from Canada, USA, Great Britain and other countries oriented toward gold mining through creation of JV with geological expeditions of State Agency on Geology and State Concern "Kyrgyzaltyn". Foreign enterprises implement financing, Agency on Geology provides detail geological data. JV are managed by the Committee on management, membership of each side depends on the share of invested capital. Geological exploration is implemented by the foreign consultants, Kyrgyz private companies and geological expeditions. Features of foreign capital activity are as follows:

- Discovery of new gold deposits within the vicinity of proved deposits
- Large size gold deposits with reserves of over 100 tons
- Geological prospecting on the basis of new approach to tectonics

2-3 Present situation in the production

2-3-1 Status of mining industry in macroeconomy

1) General situation on mining industry

Overall mining industry production, except for gold production rise at the Kumtor mine, has significantly decreased, in particular with regard to coal mining industry, which is absolutely noncompetitive due to extraction and transportation costs, low prices and poor product quality. At present 50% of the nation's oil and gas must be imported, the mercury and antimony sectors have declined due to low prices and reduced demand, and tin production has been halted (Table 2-3-1).

Table 2-3-1 Annual Production by Mineral Commodity such as Oil, Gas, Antimony and Coal

	1992	1993	1994	1995	1996	1997
Oil thousand t	113.0	87.6	88.2	88.5	84.0	-
Natural & Liquefied Gas million m ³	72.4	41.6	39.0	35.7	25.6	-
Coal thousand t	2,151	1,721	746	463	432	-
Antimony t	13,810	9,778	9,588	7,053	6,002	4,401
Gold t	1.21	1.14	1.53	1.49	1.58	16.86

2) GDP in the mining industry

In 1997, agriculture was 43.5% of GDP. Later sectors of the economy such as food industry, construction and mining industry started to develop. In 1997 owing to the start of gold production at Kumtor increased mining's contribution from 1.6% in 1996 to 5.9% in 1997 (Figure 2-3-1).

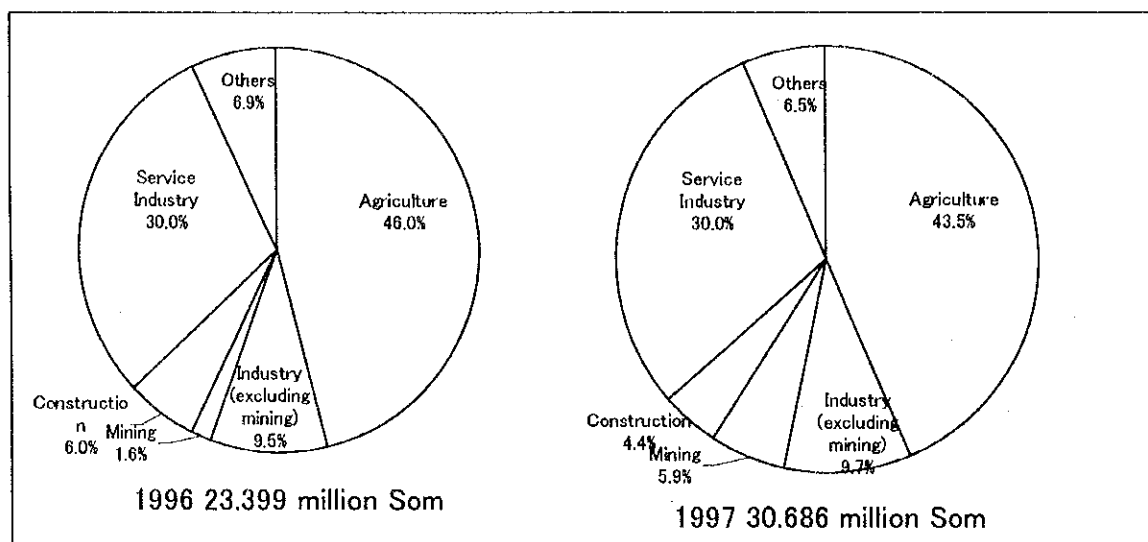


Figure 2-3-1 Composition of GDP by Industry

3) Mining industry as a foreign currency-earning sector

In 1997 owing to the gold export, share of export of the Kyrgyz Republic has increased. Rapid growth of imports in 1996 was registered mainly due to the increased imports of foreign equipment for Kumtor. Share of agriculture in GDP is high, but it is not an industry capable of earning large amounts of foreign currency (Table 2-3-2).

Table 2-3-2 Amount of Imports and Exports for Industry & Agriculture

mill. D						
	1992	1993	1994	1995	1996	1997
Export Total	274.1	356.3	340.1	408.9	505.4	603.8
Industry	269.1	344.9	329.4	366.0	442.1	558.6
Agriculture	4.3	11.1	10.6	42.9	63.2	45.2
Other Industries	0.6	0.3	0.1	0.0	0.1	0.0
	1992	1993	1994	1995	1996	1997
Import Total	366.6	437.5	317.0	522.3	837.7	709.3
Industry	344.3	406.6	288.5	505.3	810.0	674.7
Agriculture	21.7	30.4	28.3	17.4	27.7	34.6
Other Industries	0.5	0.4	0.2	0.0	0.0	0.0

The main export sectors are electric energy and mining production. In former times the first place belonged to energy export, but in 1997 all of a sudden the export of non-ferrous metallurgy increased abruptly to 35,8% of total export (216 million dollars) earnings, and electric power was shifted to the second place, having constituted 13% of the total export (83,2 million dollars). The major part of exported non-ferrous metals is gold, oil, antimony and mercury have either maintained their former level, or reduced (Figure 2-3-2).

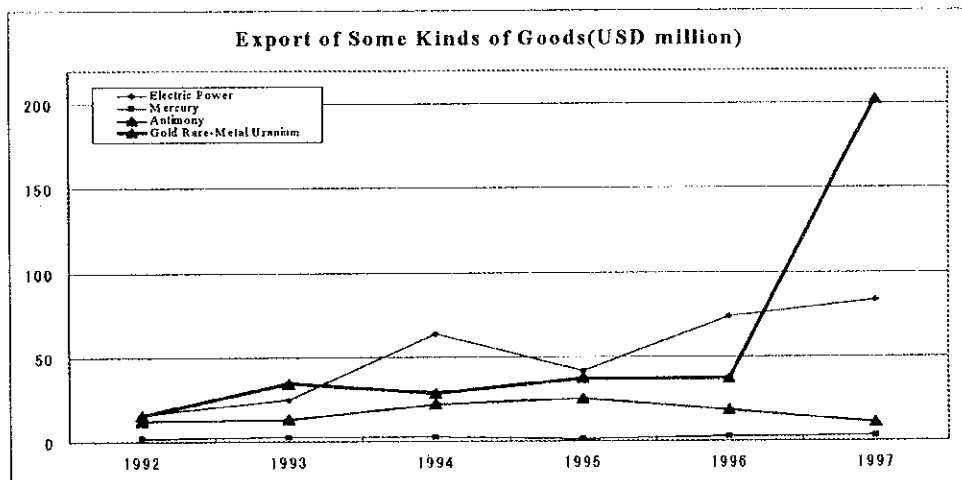


Figure 2-3-2 Export Amount of Main Export Industries

4) Mining industry and financing

The funds of combines, for restructuring and working capital, are covered at the expense of short-term loans extended by the ERRA or commercial banks.

At present time an idea is being supported to establish a Development Bank with participation of capital from Japan, Malaysia and European banks. The government of the Kyrgyz Republic also intends to contribute 20% of its share. It is supposed that the bank will extend loans for 3-5 years, and commercial banks - from 3 months to 1 year and more. The proposed interest rate is 17%, which is lower than commercial banks rate (30%). However, the Development Bank will not provide financing as a political measure. It is considered that crediting of the mining sector by this bank would be rather difficult due to high risk.

2-3-2 Situation on combines

All mining combines, except Makmal are privatized and have been transferred into joint stock companies. The State property fund announced that all the shares that the state will be sold to strategic investors for the purpose of privatization of each combine except Kara-Balta. The real privatization of combines is in stagnation. Combines are looking for a possibility to survive by mining gold in cooperation with foreign companies, or by expansion of other types of production.

The present situation for each combine, and major issues is shown in Table 2-3-3 at the end of this chapter.

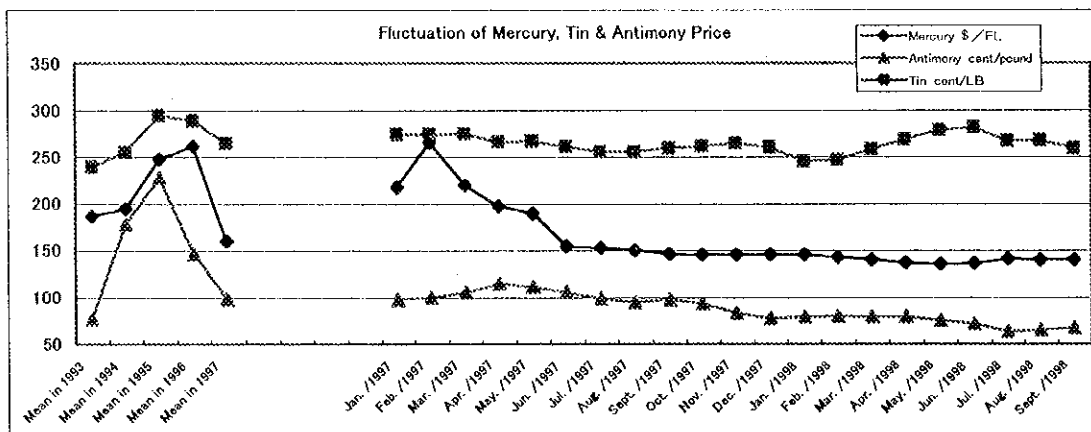


Figure 2-3-3 Recent Price Tendency of Mercury, Antimony and Tin

1) Kara-Balta

In 1997 in the process of rationalization and privatization a division of combine by subdivisions was made: production of gold, uranium, molybdenum, tin,

tungsten; laboratory (analytical service), environment protection service etc. Transfer to the profitable production of combine is outlined. Owing to the sale of shares cooperation with foreign companies came to be implemented.

The Board of Directors at the Kara-Balta combine consists of 5 people, one of them is the chairman of the State Property Fund, and the remaining 4 are elected by shareholders. The Board of Directors selects 5 people as corporate officer from the combine' personnel who are responsible for the concrete work.

- Production capacity is 20 tons a year. It is possible to increase capacity to 40 tons a year. Gold refining is not subject to privatization. Combine's own mine Kranzhay-Lau has been suspended due to the gold prices fall.
- Tin-tungsten output is idle due to the shortage of funds for development of Toldoboy deposit.
- Environment control division has the responsibility for controlling all uranium tailing dumps, but in fact such control is not implemented due to the lack of funds in the state budget.
- The combine's tailing dump pollutes the underground water by heavy metals. Now credits from European Community help to conduct the studies on this problem.

2) Makmal

Combine is directly managed by "Kyrgyzaltyn". Open pit mining has been completed. Now there is a need to develop it by underground mining but due to lack of finance, production has been delayed. Participation of foreign investors is desirable by inducing preferential tax measures such as exemption from royalty payment. But foreign investors are not interested in development of this deposit.

3) Solton-Sary

In 1994 "Kyrgyzaltyn" started open pit mining of the Altyntor deposit by own funds, and is now completed. "Kyrgyzaltyn" considers the possible implementation of exploration of this area and joint development together with "Newmont" company.

4) Khaidarkan

In 1996 a restructuring and rationalization of Khaidarkan combine was implemented under the leadership of the World Bank, but the situation has not improved due to economic insufficiency, which is characteristic of all deposits with low grades content grade, and decreasing markets.. In 1998 a Board of Directors

consisting of 5 people was established under the leadership of the Government which nominated the representatives of State Property Fund (2 people), Ministry of Industry, regional authorities, working team, but this Board does not functioning. The Board planned to privatize the combine after debt repayment, but it was not implemented.

5) Kadamzhai

In 1997 combine's joint stock sale was completed. The Government has planned to carry out privatization by selling the shares to a strong investor, but it was not implemented. In recent years due to the fall of prices for antimony, as well as decreased supply of raw materials to the combine, the condition of the combine has deteriorated. Despite of the rationalization of production subdivisions of the combine and separation of welfare facilities, there is no progress on this situation. In July 1998 a Board of Directors made a basic plan for the combine's reconstruction aimed at the diversification of production, its rationalization by taking measures on debt liabilities and personnel reduction, stable supply of raw materials from Tajikistan, and reformation of the combine's structure. But combine's capability to implement all this reconstruction by own means are limited.

6) Kumtor

Kumtor is a big mine with reserves of 750 tons, where gold open pit mining is carried out using modern methods by a JV created between "Kyrgyzaltyn" and Canadian company "Cameco". In 1997 the mine was put into operation and produced 15.6 tons of gold. In 1998 there are plans to increase to 18 tons. The Enterprise produces rough gold (gold and silver alloy) which is refined at Kara-Balta combine. Enterprise, including a mine, has 1400 workers, 90% are Kyrgyz, training of personnel is conducted by the means of own training center.

Table 2-3-3 Present Situation of Mining Combine's Ownership and Issues

Combine	Revenue '97 (Mln Som)	Production	Market	Raw Materials (own mine)	Share and Foreign Investment	Issues
1. Kalabalta Au (metal) Gold mine	168 (Total) (40% of Revenue)	Au 17 t metal Suspended	---	Kumtor, Makmal, etc. Kurajyitau 150 thous t / yr (plan)	Kalabalta Combinat. J/V Andrei (Swiss)	<ul style="list-style-type: none"> Out of object for privatization Unstable investment supply from Andrei Company High cost of transportation of ore Countermeasure of environmental protection
Uranium	(20% of Revenue)	Utilization 50%	---	Kazakhstan	J/V Kazkh shareholder 65 % under negotiation	<ul style="list-style-type: none"> Introduction of treatment technology
Molybdenum	(10% of Revenue)	Utilization 40%	---	Under Investigation	J/V Mekomin (UK) 70 % under negotiation	<ul style="list-style-type: none"> Under construction 80 % suspended Necessary investment \$14 million
Tin	---	---	---	Sary-Jaz (Tordovoy)	No foreign investor	<ul style="list-style-type: none"> Aged equipment especially analysis equipment
Laboratory	---	---	Domestic	Central Laboratory	J/V Alex Stewart (UK)	<ul style="list-style-type: none"> Open pit reserves exhausted (mine life 2 years) Delay of underground development (low efficiency and technical level) Reconstruction depends on exemption of gold royalty (1998-2003) Establish heap leach technology for low grade ore Comprehensive mine re-evaluation (F/S)
2. Makmal	230.4	Au 1.2 t metal	---	Makmal 375 thous t / yr (plan)	Kyrgyzalyn	<ul style="list-style-type: none"> Completion of Alyn-for open pit mine Comprehensive development examination needed (F/S) Sharp decrease of ore reserve due to increase of mercury cut-off grade Need economic evaluation on mix ore Settle mercury royalty change 12% → 2% Lack working capital (stockpile increase) Management on break-even line No hope for work for new comers Need to examine countermeasures of energy loss Lack of geologists Pre-payment system (common in barter system) Environmental countermeasure, etc. Shift to gold mine development
3. Solor-Sary	---	---	---	Alyn-Tor (Kyrgyzalyn) Buchuk (Newmont)	J/V Newmont (USA)	<ul style="list-style-type: none"> Government share (MTII 97%) Employees (3%)
4. Khaidarkan	54	Mercury 610 t Fluorite 5750 t	Outside (90%) Competitor China under negotiation CIS	Own supply (UG 2 mines) Mercury mine (200 thous t / yr) Complex ore mine (100 thous t / yr) Own supply (complex ore mine)	Government share (Kyrgyzalyn 70%), now State Property Fund Pension fund 6% Social insurance fund 8% Coupon 11% Employees 5%	<ul style="list-style-type: none"> Decrease of income due to decline of antimony metal price Unstable raw material supply from Tajikistan and Russia Increase of self-sufficiency rate (due to development of Appshell and Tereksai deposit) Re-evaluation of Kadarnjai deposit Development of gold bearing antimony deposit (Savoialdy) Rationalization limit of own reconstruction of combinat Reduce exemption of antimony royalty for one year Diversity of products (promote gold, silver, tin etc.)
5. Kadarnjai	---	Sb 4401 t	Competitor China	% own supply 38.2% Russia • (saba) Tajikistan Chimkent Kadarnjai mine (life 20 yr, low grade, Sb 1% more, simple ore) Appshell (open pit under development, Sb 4%, simple ore) Tereksai (Sb 2%, complex ore)	J/V Cameco (CA) 1/3 Kyrgyzalyn 2/3	<ul style="list-style-type: none"> Ore reserve of gold metal 750t, New obtained ore reserve by around exploration 20t Inducing up-dated maintenance technology (large scale open pit mine, CIF method) Minable ore reserve of gold metal: O.P 288t, U.G 266t Employees 1400 (Kyrgyz 90% of them) Having own training program for employees Supply teaching staff to Mining-metallurgical university
6. Kumtor	150.4 mil.\$	Au 15.1 t metal	---	Kumtor	---	---

Note: 30% of rest of revenue at Kalabalta combinat. is occupied with sale of dust, mask etc. and other parts

2-4 Existing structure of mining industry

2-4-1 Structure of mining industry and its functions

There are various central bodies related to the mining industry management implementing their functions, but there is no unified body on industry's management (Table 2-4-1).

Table 2-4-1 Role of Organizations in the Mining Field

	Organization Name	Main Role
Prod Policy Plan, Adj	Dept of Economic Policy	Direct Policy Plan
	Dept of Ec. Dev. & Finance	Finalize Admin Measures
Budget Formation	Budget Dept	Make Intermediate Budget
	MOF Macroeconomic Dept	Rec Budget Request → Make Budget
Administration	Center fo Soc & Ec Reforms	Check Gov Admin Organization
Rationalize, Privatize	State Property Fund	Promote Privatization
	St Com Foreign Inv & Ec Aid	Introduce Foreign Inv
	Ent-s Restructuring Dept	Promote Bus. Reorg By Intl Fin Inst
Mining Adm & Control	Industrial Policy Dept	Industrial Production Cond Survey
	St Com Control Use of Min Res	Safety Supervision of Mine Site
	St Ag of Geo & Min Res	Distribution of Mining License
	Min of Environment	Control & Supervision of Mining Env
Survey, Production	St Com Control Use of Min Res	Survey to Grasp Resource Pot.
	St Concern 'Krygyhzaltyn'	Min Comb Mgmt, Promote J/V Foreign Inv
	St Com on Statistics	Production Statistics Survey
Resource Management	Commission on Reserves	Effect. Dev Super. St Min Res
Land Resource Mgmt	St Ag Use of Land	Adjust Mining Ind on Ag Site
Intro to Foreign Inv	St Com Control Use of Min Res	Promote Foreign Capital Inv
	Ag on Foreign Investment	"
Research Org	St Com Control Use of Min Res	R & D of Exploration Survey
	Min of Sc, Ed and Culture	Material Laboratory
	Academy of Science	Seismic Res Inst, Rock Mec Lab
Industry Assoc	Krygyz Mining Association	Info Service to Member & Propose to Gov
	Assoc of Miners & Geologist	"

2-4-2 Role of major bodies of mining industry management

1) State Agency on Geology and Mineral Resources

① Licenses for ore exploration and development

The State Agency on Geology and Mineral Resources implements the issue of licenses for ore exploration and development. Application for getting a license should be also submitted to the local administration which issues land use permits.

- Together with the application for getting a license for ore exploration it is required to present a Plan of ore exploration. It is strictly prohibited to issue the licenses on exploration in the natural park areas.
- It is necessary to attach a Business development plan to the application for

development. Results of F/S and documents on land use (boundaries of land allotment, compensation etc) are to be also attached to the Business Plan. A copy of the application on development is also sent to the local authorities, but they have no right to deny the license issuance. Evaluation of the application for getting the license for development is done by the following organizations.

- Agency on Geology :
Consideration from the legislative and economic points of view and final decision
- Ministry of Environment Protection :
Consideration from the environment protection point of view
- Gostekhnadzor :
Consideration from the production safety point of view

② Storing of information and its accessibility

All the data on results of prospecting and geological exploration carried out in previous years are stored in the archives of State Agency on Geology and Mineral Resources (it subordinates to the geological division). According to the Governmental Decree of 1997 all this documentation became, but a permission of head of geological division or even Director of Agency for some materials is still required. Copying and taking out of materials are also regulated. The storage place does not have a copying machine. Nothing has been still done to simplify the data acquisition procedure.

2) National Committee on Reserves

As in Soviet times, Commission on Reserves deals with checking of methods on calculation of reserves, approval of reserves and F/S evaluation. Without approval of reserves it is impossible for enterprise, including enterprises with foreign capital, to continue on to development. F/S evaluation is obliged in the case of exploration based on the budget.

3) Commission on Natural Resource Use

State Commission on control of mineral resources utilization is specially established for issuance of licenses for exploration and exploitation. Licenses for ore exploration and exploitation are issued by Commission based on tender (announced via newspapers). Commission checks the mining methods, losses, recovery ratio of processing test, implementation of a plan on use of mineral resources etc. But it not only deals with checking the implementation of

geological exploration plan (which is attached when submitting the license application), but also the implementation of planned investments. All this is performed by periodical reports.

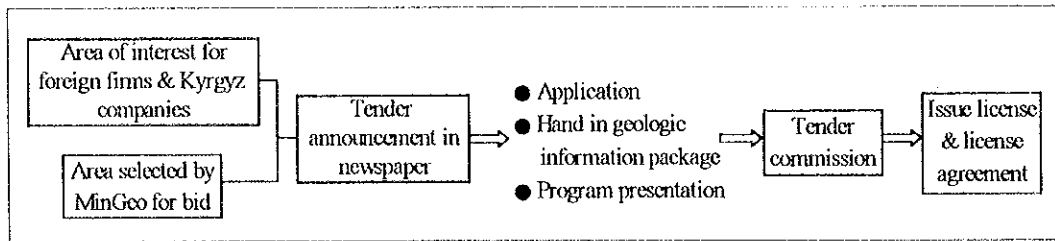


Figure 2-4-1 Flow of License Acquisition

4) Ministry of Environment Protection and other structures related to the environment protection

① Different structures and their role

In addition to the Ministry of Environment Protection, there are other different structures related to environmental protection (Table 2-4-2). Governmental bodies include local structures, interacting with central ones, to fulfil the central government's functions in their own districts.

② Environment control

Environment control is conducted on each combine. Ministry of Environment Protection implements a system through its central and local supervisors of environment control on each enterprise. Each structure on environment protection is identical by their goal and functions subdivisions for control and research. Thus, structures in their activity have double functions.

③ Environment monitoring

Environment monitoring is conducted by the monitoring subdivision of Ministry of Environment Protection. Measurement devices and laboratory equipment are quite out-dated, deteriorated and by no means appropriate for monitoring and environment control. Monitoring of radioactive substances is implemented by the new structure on radiation monitoring under Kara-Balta combine.

Table 2-4-2 The government organization in related to the environment and their role

Organization	related with Mining development	Role
The Ministry of environment protection	○	It is the integrating organization for the environment protection. There are mainly 8 departments. It collects various monitoring data from the other organization and also it directly monitor the exhaust gas and the drainage. Then it does the environmental control. It has the independent organization to analysis in the monitoring division. It has the authority to inspect the environmental assessment which is mentioned in application form of the plan of deposit investigation and mine development.
The Ministry of health		It's Inspection Bureau of Sanitary & Epidemiology monitor and inspect air, water and soil, based on the Law of the Health, to watch over the environmental material (harmful material and microorganism) which has a heavy influence on the human health of habitat. Also, the central laboratory of the poison and the science laboratory of environment and industrial hygiene, the attached organization, research an influence for the health of heavy metal and etc..
The Ministry of agriculture and water resource	○	There are three bureaus related environment, the bureau of the chemical and protection of the plant, the bureau of the water facility and the fisheries bureau. The bureau of the chemical and protection of the plant monitor water and soil of the agricultural land and the pasture, and irrigation water. The fisheries bureau monitor water of the lake and pond. The bureau of the water facility has the authority of the permission for the right of using all type of water (the water quantity of appropriation and the discharge) and of the water distribution for various use.
The State Agency on Geology and Mineral Resource	○	It examines a necessary item of the environment protection for the application form of an investigation and a development of the deposit. Also, it monitors and inspects for the protection of underground mineral and water resources, and the covering after operation. The underground water corps under the Agency has 700 observing wells over the whole country, and monitors them regularly. Also, it has many various service of the underground water such as the investigation of the water quality and the pollution source, the decision of the water quantity to pump up, the permit for the right of using, and the inspection of well facilities.
The State Agency on Use of Land	○	This organization has lastly the approval right of using on land. It inspects to confirm the appropriate land use. Also, it advices appropriately to the rehabilitation plan on the land. In addition, it can actually construct with the commission of the rehabilitation business.
The State Agency on Forestry	○	This organization has 36 branch office in the whole country and protects the forest based on the Law of the Forest. It implements a various monitoring (mainly for water) and inspects, from the viewpoint of the forest preservation. It is obligated to preserve and rehabilitate the forest for the road construction and the mine development and so on.
The State Agency on Meteorology		Before establishment of the Ministry of environmental protection, this organization had observed the atmosphere, water and soil, too. At present, it observe only the vick area pollution. It has total 14 observation points of the air contamination in 4 cities and 91 observation points of the surface water qualities on the chui river mainly. These observation results are notified to the Ministry of environmental protection.
The Ministry on Emergency Situations and civil defense	○	The Ministry protects the citizen from the accidental emergency such as the disaster and so on. It manages the environmental protection in this case. It does the urgent counterplan such as the prevention construction against the erosion of the tailing dam and waste stage. The Department of State Technical Supervision permits the producing system and facilities (containing pollution control facilities) on the mining development. Also, the Ministry integrate the labor safety and sanitation.
Kara-Balta Combine	○	This combine must be obligated to manage the suspending and/or abolished mine by the Edict of the president. The combine makes Chu environment laboratory, subsidiary organization to do a technical support and an environment monitoring. Especially, this laboratory does the monitoring for the radioactive substances pollution.

④ Problems with environment protection in the mining industry

There are many environmental problems related to suspended and ceased coal mining operations, uranium mines, rare-earth mines, as well as waste rock dumps and tailing pond, and operating combines.

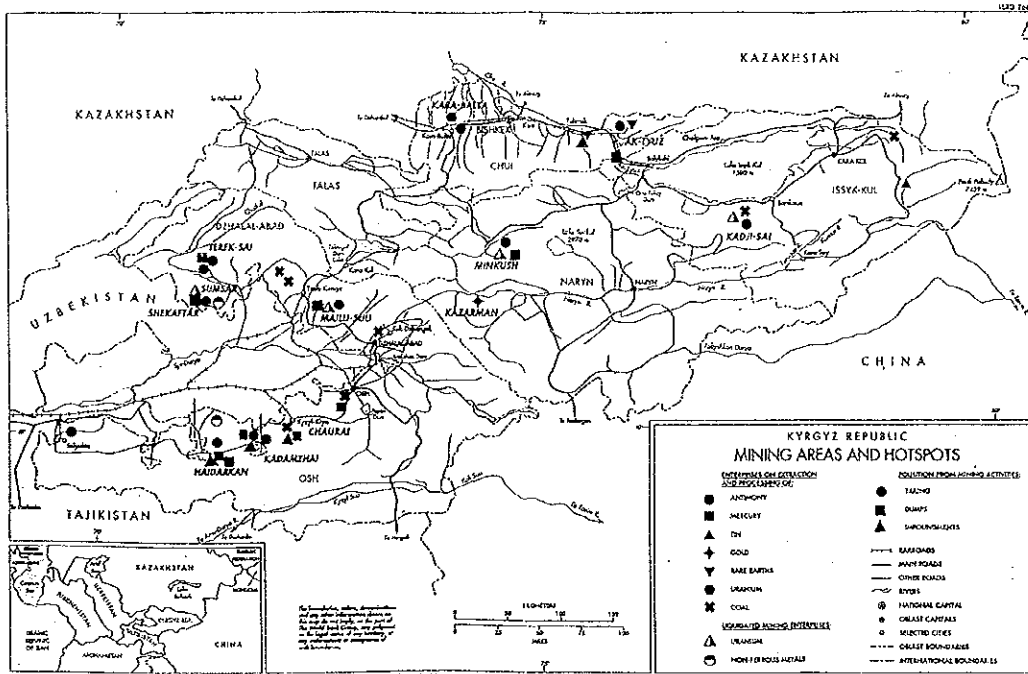


Figure 2-4-2 Area Where the Mining Industry Environment is a Problem

5) Non-governmental organizations

① Kyrgyz Mining Association

Members of Association are mining combines, foreign companies, consulting firms, etc. It holds seminars on the mining industry. Through constructive dialogues on an informal basis with the representatives of legislative and executive bodies a business point of view on mining policy is brought to the governing bodies to achieve regulation of relations between the governmental bodies and business circles.

② Association of Mining Producers and Geologists

The Association of Mining Producers and Geologists was established with a purpose of increasing the intellectual potential in mining industry and geology and currently unites the scientific and mining practices. Association involves 10 corporate bodies including Kara-Balta combine, Kyzyl-Kiya Coal Mining Enterprise, etc., and membership to 150 people.

2-5 The present situation in the sphere of legislation and taxation system

2-5-1 Most important laws related to the mining industry

1) Law about mining activity (Law on Entrails of the Earth)

The essence of the Law about mining activity (Law on Entrails of the Earth) is as follows:

- Law on Entrails of the Earth announces that underground resources are an indispensable part of state property.
- Obtaining of a license (for geological exploration and development) is implemented according to the principles: participation in tender, auction and direct negotiations.
- Term of license for geological exploration is 2 years. In the case if the license agreement concluded with the governmental body is strictly observed, longest period of 10 years, besides the right to development is acquired.
- A consent of the governmental body should be obtained in order to use the license as a collateral or to transfer it to the third person, approval of the appropriate governmental organization is needed
- The user of entrails is obliged to submit different reports (on prospecting, on remaining reserves, on extracted reserves)
- National Bank and governmental bodies (State) have a priority right in purchasing of gold and mineral resources. The entrails users are obliged to notify governmental bodies of supposed sales in advance
- The entrails user is obliged to pay royalty (payments to the fund on entrails development) and a bonus for the right of usage

Peculiarity of this Law is that Soviet concept and system still remains in the terminology of many articles: such notions as state control and state production.

2) Law on Foreign Investments

Previous Law on Foreign Investments has provided for such concrete measures on granting privileges as exemption and reduction of taxes on profit, repatriation of income, customs duties. However, this law was revised in September of 1997, and all the benefits concerning foreign investments have been abolished by the new law.

Most notable articles of the new law are as follows:

- Foreigners may be legal entities and as real persons, foreigners are equal to Kyrgyzstan entities without any discrimination.
- The Law provides foreigners with both personal guarantees and guarantees on

invested capital.

- Allows registration of profits and transactions with foreign currency.

3) Laws related to the Environment Protection

In Kyrgyz Republic there is a system of legal regulations on environment protection, including a Law on Environment Protection.

2-5-2 Tax Code in conformity with the mining industry

① Tax Code of Kyrgyz Republic

From 1st of July of 1996, an approach based on international standards is introduced into the Tax Code of Kyrgyz Republic. As result of this, entrepreneurs are granted with the following privileges:

- Transition from the soviet depreciation system of fixed straight line method to the system of accelerated depreciation by which expenditures may be amortized in the short time
- Tax on profit is fixed at 30% for all activities, whereas, previously tax on profit varied depending on the kind of enterprise between 15 and 55%
- VAT on exports abroad, excepting CIS countries, is equal to zero
- Carrying forward losses for 5 years is foreseen

It is noted that heavy burdens on the entrepreneur are the road tax (0.8%) and payments to the Emergency Fund (1.5%) as their share in total amount of payments, is quite high.

② Taxes related to mining industry and expenses burden of entrepreneur

Taxes related to the mining industry are royalty charged on the gross revenue (Table 2-5-1). Besides that there are road tax and payments to the Fund of Emergency situations which are also charged on the gross sales volume. All these taxes are a heavy burden of entrepreneur.

Table 2-5-1 Mining Industry Related Expense Burden (Tax, Commission, User Fee)

Name of Fee	Payment, Share of Ownership
License declaration fee	35-50% of license issue fee
License issue fee	10 months of minimum monthly wages (1,140 som: 1999)
Land use fee for survey & exploitation	Local government calculates, obligation
Payment for right of utilization of mineral reserve(bonus)	Temporary payment for license acquisition
Payment for utilization of underground mineral resource(royalty)	2-15% of proceeds can be imposed every year with the percentage depending on the mineral Gold 5%, Silver 5% Mercury 12%, Rare earth 12%, Antimony 12% Tin 15%, Tungsten 15%
Concession fee	No results

Table 2-5-2 Mining Related Tax Revenue (1997)

(1 0 0 0 som)

Combinat	Type	VAT	Income Tax	Profit Tax	Excise	Road	Emergency Tax	Land	Other
Makmal	Gold		5,351.6	16,806.3		1,826.5	2,567.3		403.8
Kumtor · ope	Gold		14,961.6						
Kumtor Gold	Gold		3,422.3						
Kumtor Ope	Gold	1,463.2	-46.6						
Jerui	Gold								
Kadamzhai	Antimony	17.2	1,634.1	3,526.7		2,129.8	4,212.4	0.56	822.7
Khiadarkan	Mercury		566.2	1,326.7		442.0	1,241.3	87.00	471.2
Tashukumir	Polyery Silicon	2,727.3	183.5			5.4	296.0		72.6
Srukchanskaya	Antimony	1,481.0		32.5		150.0	320.0		53.0
Kyzylkel	Coal	1,529.3	168.1			95.0	238.2		36.0
Akchuz	Coal		-255.0					0.77	
Kokyangak	Coal	1,285.9				38.1	204.4		15.8
Akchutuz	Rare earth	20.0	16.0	10.0		1.3			
Karabalta	Au,U, etc	-5,052.3	3,479.3	-5,291.2		727.6	2,301.3		803.0

③ Taxes related to the Environment Protection

In Kyrgyz Republic there is a system of collection of duties (taxes) for environment protection. These taxes are paid to the Republican Environment Protection Fund. Since 1998 such payment of this duty has been 1% of profit after taxes.

2-6 Current situation at the model (Khaidarkan) combine

2-6-1 Production and management index of Khaidarkan combine

Situation of Khaidarkan combine is extremely difficult due to the reduction of mercury sales market and overstocking of fluorite at warehouses. Below there are tables giving a comparison of actual production and management index of combine in 1997 with figures envisaged by the restructuring plan of ERRA. Besides that, the tables concerning accumulation of unsold fluorite at warehouse and electric power consumption are given below.

Table 2-6-1 ERRA program on marketing and comparison of this program with actual results

	Actual results in 1997			ERRA program		
	Sales volume (t)	Unit price (\$)	Sales amount (\$ thousand)	Sales volume (t)	Unit price (\$)	Sales amount (\$ thousand)
Mercury	627.4	4,167	2,614	*669.3	3,478	2,328
Antimony	61.7	744	46	993.6	400	397
Fluorite	4,073.0	216	879	6,400.0	137	877
Total			3,539			3,062

* Amount of sales on mine #1 has amounted to 552 t, mine #2 -117,3t.

Table 2-6-2 Factors and costs of production according to ERRA program and their comparison with actual results

	Actual results in 1997	ERRA Program
Volume of ore production, t		
Mine#1	140,596	200,000
Mine#2	71,393	100,000
Content in ore, %		
Mercury	*0.35	0.30
Antimony	*0.50	1.80
Fluorite	*13	16
Volume of production, t		
Mercury	610.9	669.3
Antimony	63.9	993.6
Fluorite	4,176	6,400
Costs of production, thousand \$		
Full prime cost	3,279	3,278
Wages	587	662
Management costs	711	307

* Estimated content in 1997.

Table 2-6-3 Dynamics of output volumes, shipments and remained reserves

	Mercury, t	Antimony, t	Fluorspar, t
Remainder as of 31.12. 1996	91.1	2.0	*874.7
Output volume in 1997	610.9	63.9	4,176.0
Volume of shipments in 1997	627.4	61.7	4,073.0
Remainder as of 31.12. 1997	74.6	4.2	1,812.4
Output volume in 1998	629.0	147.0	3,005.0
Volume of shipments in 1998	617.5	95.6	1,357.0
Remainder as of 31.12. 1998	86.1	55.6	3,460.4

*Data on remainder as of end of 1996 were given verbally.

Table 2-6-4 Electric power consumption on Khaidarkan Combine

Years	Electric power consumption (kWh)	Tariff for electric power (som)	Cost (som/kWh)
1992	53,376,044	2,204,825	0.041
1993	55,309,585	5,582,806	0.101
1994	48,149,604	5,297,156	0.110
1995	41,917,845	6,178,466	0.147
1996	39,838,286	5,832,692	0.146
1997	27,827,486	6,076,847	0.218

2-6-2 Problems of Khaidarkan combine

① Natural resources

- Layers of deposit are situated on the gentle slopes, grade of mercury and fluorite is low. If cut-off grade in excavation will be increased by 0.3%, deposits are significantly decreased and are scattered.
- Largest part of the upper layers of the mercury deposit (Mine No.1) has been already mined out.
- Since upper layer of fluorite deposit (Mine No.2) includes oxidized antimony, recovery ratio in processing is low.

② Mines

- Productivity is under the figure planned by ERRA program. In addition, opening stage for mine production is delayed.
- In mines No.1 and 2, the amount of underground water is increasing in the case of the lower part development.

③ Mercury refinery and processing plant

- Equipment has excess capacity compared to present production volumes, moreover, it is worn-out.
- Kiln has no equipment for exhausted gas treatment.

- Due to the drain of engineering personnel, technical maintenance of equipment at processing plant is complicated.
- Operation of processing plant is unstable due to the increasing overstock of fluorite.

④ Environment control

- Renewal of measurement instruments and analyzers has not been carried out for a long time.
- Personnel rationalization is carried out, but present monitoring facilities are insufficient.
- No measures on prevention of water leakage from the roasted ore waste dumps have been undertaken.
- In tailing dump, there is no waterproof layer so water leaks into the ground.

⑤ Sales market

- It is possible to support a present level of mercury market, but the mercury products market with high added value is limited.
- Fluorite loses its assessed value at barter transaction.

⑥ Production management

- There is a lack of knowledge on financial situation of combine, and profitability of subdivisions is not considered.
- There is a problem with evaluation of fixed asset and inventory, and with arrangement of accrued interest for credit.
- Due to the overstock of unsold goods, there are large debts.
- Combine's situation is also complicated by the increasing prices for materials and equipment, and electric power as well.
- Strategy of mercury and fluorite production is absolutely unclear.
- All attention is paid to the production, but none to the environment problems.
- Support of welfare facilities in the region is the combine's responsibility.

2-7 Current status of basic economy spheres relevant for mining industry

2-7-1 Present state of infrastructure

1) Transport

Automobile transport plays an important role in transport sector, with railway of considerably less important. Improvement of the connection conditions of two large economic and cultural centers – Bishkek on the North and Osh on the South is an important problem for the State's development strategy. At the present time there is no railway communication between these cities, and ground transport by a single automobile road that is often blocked in the winter.

① Main roads

Network of main roads is well developed and connects major cities of Kyrgyzstan. At the present time road capacity of the existing road network is satisfactory in general. But roads and facilities are very worn-out and their condition is terrible, because of insufficient funds for the technical maintenance and control are allocated from the state budget due to the poor situation with the state finances. Moreover, main roads in mountain areas suffer from rain, frequent mountain slides and snow slides. All the above factors hinder normal development of the national economy.

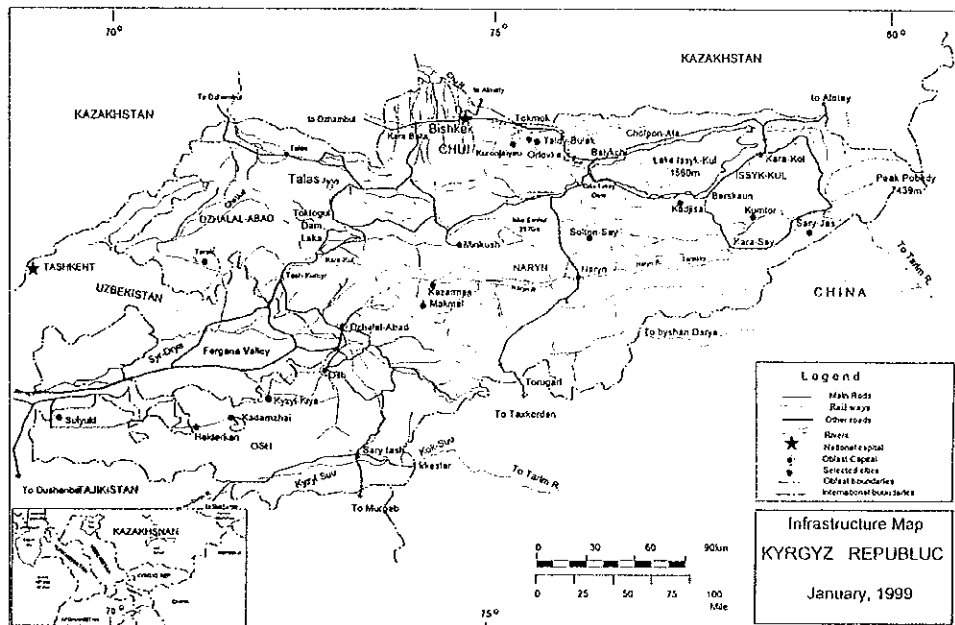


Figure 2-7-1 Railroad and Road Map

② Railway transport

During Soviet Union period, railways of Kyrgyzstan were a part of the Central Asian railway network. Now there is no independent railway system in the country. Government of Kyrgyz Republic has a concept of construction of railway North-South and West-East, which is connected with a plan of formation of an independent railway transport.

- Railway North-South will connect Balykchi with Djalal-Abad. It will facilitate transport communication between Bishkek and Osh, and promote development of coal basin Kara-Kiche along the railway line.
- Railway West-South was planned to connect the cities of Uzbek, Andizhan, with Kashgar of Xinjiang-Uigur autonomous areas (China) through Osh, Kazarman and Torugart.

2) Power engineering industry

Kyrgyz Republic has rich hydro energy resources. At present time it imports oil and natural gas from Uzbekistan, coal from Kazakhstan, and in return exports electric power to both these countries. However, owing to this industry's privatization policy and considerable decrease of state subsidies in power engineering, prices for industrial consumption of electric power have sharply increased. Nevertheless, tariff for electric power is at its cost level – 0.03 USD/kWh, but this figure is expected to increase.

① State of power engineering industry

At the present time in Kyrgyz Republic 5 large and 6 small hydroelectric plants are operating, large plants are located on Naryn River. 75% of all electric power supply in the country comes from hydroelectric power engineering.

② Electric power supply network

The existing network covers the major cities and operating combines, but it is not available in remote mountain areas.

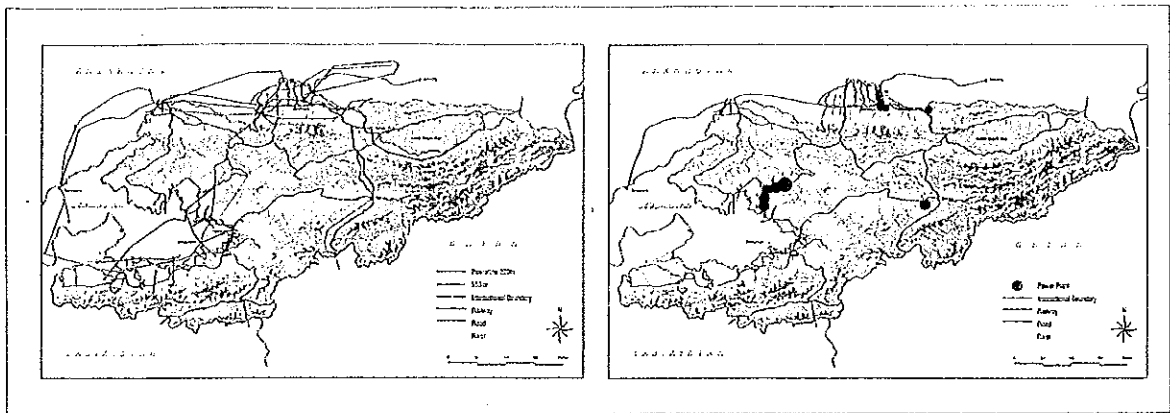


Figure 2-7-2 Location of Hydropower Stations and Network of Electricity Supply

③ Problems of hydroelectric power system

- Almost all the small and medium scale hydroelectric plants have been built about 40 years ago, their performance has decreased considerably. According to the plan of “Kyrgyzenergo” the specific cost of construction works on the rehabilitation of small and medium scale electric power plants will be \$1300-3100 /kW. After rehabilitation, the cost of electric power will amount to 2.7-3.0 cents per kWh.
- According to information received from the governmental bodies, equipment of transformer stations and main electric lines are very worn-out. Losses on electric power delivery lines and electric distribution lines are high. If we will add up all the thefts from the lines, losses are estimated at 20-30% of annual production. To renew electric power delivery lines and electric power distribution network, it is necessary to spend 3.6-4.0 bln.USD, but situation with financing is not clear.

3) Communication

In Kyrgyz Republic, 96% of shares of communication related enterprises are in the possession of the State. Practically “Kyrgyztelecom” is a monopolist. Besides the old coaxial cable connecting the Kyrgyz Republic to the International Telephone Network (via Moscow), there is a small INTELSAT international satellite station interlinked with a repeater base in Turkey.

As regards for other kinds of communication, in the field of mobile telephone communication participation of foreign capital is expected. Joint ventures with foreign capital provide services on mobile, radiotelephone and paging communication and Internet.

2-7-2 Present situation of education system

① Education system in a whole

The education system of Kyrgyz Republic has inherited, in general, all the features of Soviet educational system. It includes mandatory 11 years Secondary (primary, secondary, and extended secondary) and Higher education.

② Higher education in mining

The Kyrgyz Mining and Metallurgy Institute was formed as a result of one of the faculties splitting from the Kyrgyz Polytechnical Institute. It specializes in preparing personnel for Mining and Metallurgy. In January 1998, there were 560 students, 2 faculties and 8 departments.

There are three different terms of study after which the different degrees are granted: correspondingly, Bachelor's (4 years), Degrees in Geology, Environment, Mining Electrical Engineering (5 years), and Master's (6 years).

③ Professional and technical education

Bishkek Technical College created such centres in Kyzyl-Kia (35 staff) and Kazarman (16 staff) where miners are being educated.

3. Mining Industry Problems

1) Raw material resources

- Surveying and geological exploration for a number of mineral resources has been suspended.
- Calculation of reserves, based on the type of a deposit, is highly accurate and there are no problems with the calculations (foreign companies use this calculation). Computer reserve calculations is not commonly observed.
- Overall gold potential is very high, but there are a few large deposits. There are a lot of small and medium sized deposits with complex ores, majority of them requires underground mining.
- The copper deposits are small to medium in size. There are no deposits with ores that can be processed by using SX-EW method.
- Tin deposits are primarily "hard rock" occurrences. They are noncompetitive because in many countries tin deposits are formed in placer and production cost is cheap.
- The ore grades of the Kyrgyz mercury deposits are very low. Besides that, in the Khaidarkan deposit the deepening of working horizons has being started.
- Grade on antimony deposits, in general, is low – 1-4%. In the Kadamjay deposit deepening of the working horizons has being started and has resulted in an increase in production costs.

2) Geological exploration and development

- Due to budget cuts the volume of exploration work has been considerably decreased.
- Exploration equipment and facilities are out-dated and physically worn-out.
- The old Soviet concept that the role of the geological exploration industry, is purely exploration still prevails
- Role of “Kyrgyzaltyn” is unclear; its activity is carried out on self-supporting basis.
- As result of changes to its Law on Foreign Investments, measures granting preferential treatment to foreign investments have been removed.
- Estimation of previous exploration costs is an obstacle to the JV development of deposits requiring foreign capital participation.
- The State Concern “Kyrgyzaltyn”, geological expeditions and Joint Venture companies all explore for large and new gold-bearing deposits.
- Geological exploration work depends on foreign capital. Activity is presently

low due to the low gold price.

- Evaluation of natural resources of the country is not performed in accordance with the requirements of a market economy.
- There is a lack of acceptable project evaluations, especially for small ones, under market economy conditions.
- Underground mining is carried out by the vertical-horizontal expansion method using shafts and rail method in most mines, so as a result mine workings are very complicated.
- In the last few years mine development with domestic capital has been restricted to the state concern “Kyrgyzaltyn” development of the Altyntor gold deposit.
- There is no Research Institute for the development of mining technology for arsenic-bearing gold deposits and complex ores processing.
- There is no full-scale copper smelter for the metallurgical refining of gold – bearing copper ores.
- There is no system of open and easily accessible geological information on mineral resources, and available information is primarily in Russian and has not been translated into English.

3) Combines

The following may be added to the content of chapter 2-6-2 “Problems of Khaidarkan combine”:

- For many deposits deepening of working horizons usually to lower grade ores has being started which has led to increasing production costs as well as grade down.
- Mining methods are not suitable for differing types of the deposits (system, used equipment), and as a result the percentage of dilution is high.
- Safety regulations are standard ones (uniform).
- Due to the break-up of raw materials supply system production capacities became excessive.
- Income has decreased due to low prices for metals and a decline in demand.
- Environmental issues are not well defined and there seems to be an environment pollution by the heavy metals.

4) Organizational aspects of mining industry

- There is no single management body responsible for the whole mining industry.
- There is no official body that can deal with planning, evaluation and, coordinating the work of organizations related to mining industry.

- The functions and inter-relationships of agencies are not are not well defined.
- There are many organizations, both central and local, exerting control over various aspects of the mining industry. Their relationship is not clear and many functions are the same. As a result, the control system for the industry has many layers and the implementation of procedure and formalities is knotty and inefficient.
- Openness of information is not systematized causing administrative disbelief and irrationality.
- Administrative services in SAGMR are intermixed with practical ones.

5) Mining legislation

- The spheres of interference of state bodies for the control of licensing, mineral resources use, and reserve approval are various and wide.
- Unlike other countries where after a license is obtained, documents are presented to the state bodies responsible for exploration, exploitation and other information, in the Kyrgyz Republic it is necessary to conclude a license agreement with the state bodies.
- Usually in other countries the reserves and F/S are not controlled by state organs however, in the Kyrgyz Republic they are. In the development stage, proved reserves and F/S content must be controlled and strictly followed.
- It is not envisaged priority system for application that interferes with exploration activity.
- The priority right of the state to be first in purchasing gold and other mineral raw materials and requirement that the state should be noticed of such deals in advance restricts the purchase and sale on the market.
- Control under land allotment (registration, write-off, state of activity) is not systematized.
- Boundaries of licensed areas for exploration are not fixed and their size is not limited.

6) Foreign Investment Law and tax system

- Incentive abolishment for foreign investors blocks foreign companies' activity because of high investment risk for businessmen.
- Real rate of royalty including road tax, Emergency Fund and other payments imposed on gross sales is very high.
- There is no tax system stipulating the specific conditions for the mining industry (amortization, exploration risk). Mining policy aimed at increasing

investments in small and middle size enterprises, industry development to attract foreign investors, promotion of special productions and industry development in special regions is not in place.

- Land use fees and payments for land for the purposes of exploration and exploitation are paid to local administrations; the amount of payment is subject to negotiations with local administration and the process is time consuming.

7) Environment protection

- The Ministry of Environment Protection has equipment for ecological monitoring but its function is insufficient. The Ministry also collects ecological data from other organizations.
- There is a control system for tailing ponds and tailing storage places but it is not working due to lack of financing.
- Payment system for environmental burden is mainly aimed at maintenance of national parks and so on.

8) Privatization

- The reorganization of Combines into separate enterprises and the transmission of social sphere to the local administration have not facilitated privatization but have resulted in some rationalization of the industry. The Combines continue to pay social payments as before.
- Standards of accounting are non-conformable to international standards. Thus, it is impossible to clearly evaluate profitability by subdivisions and make estimations of assets.
- Due to collapse of the USSR the Combines were faced with the need for structural change. The Combines, except for Kara-Balta Mining Combine, now work on a self-supporting basis, however, the economic state of the Combines has not been improved due to non-payment of debts and other reasons.
- Production subdivisions of SAGMR are geological expeditions which work on self-supporting basis. The major part of geological exploration work is carried out with foreign Joint Ventures which results in instability. In addition, the expeditions are to allocate some money to the head office (SAGMR) to cover management costs and pay taxes. Their independent activity is encumbered by mentioned above factors.

9) Infrastructure

- The infrastructure of Kyrgyzstan, which is mountain country, developed primarily in the northern part of the Republic, whereas, the southern part of the nation's infrastructure is poorly developed.
- In mountain areas with high potential for the mining industry, motor transport and power engineering is not well developed. Large investments in infrastructure in regions with high mining potential to facilitate exploration and exploitation of the deposits are necessary.
- Telephone communication is not developed, except cities. In mountain regions the only way to communicate is to use expensive satellite communication.

10) Education

- In the mining sector, and in particular in the Combines, there has been a considerable rationalization and staff reduction. Training schools for personnel no longer function.
- Organized personnel training conforming to market economy requirements is not carried out.
- Foreign companies investing in the mining industry should conduct personnel training themselves.

11) Closely related industries

- Mechanical engineering and other related branches to support mining industry activity are not developed (explosives, bits and roads, spare parts).
- Advanced technology of the western countries is promoted but a system for its maintenance has not been developed.
- The equipment of subsidiary divisions, which are separated from the Combines (mechanical-maintenance sector, transportation sector, and sanatorium), is worn-out. Concrete measures to create conditions for independent activity of these subdivisions are not performed.

4. Plan of Mining Industry Promotion

4-1 Basic course of mining industry promotion

1) Basic course

Mining industry of Kyrgyz Republic is closely connected with the revival and promotion of the economy for the whole state and development of the regional economy as well.

Concrete course of industry's promotion is as follows:

- Give preference to increasing gold mining
- Acceleration of the rationalization (restructuring) of existing combines

2) Target production figure by the types of ores

Target figures by the types of ores are as follows:

- Increase of production of gold, goal is to achieve the level of 30 tons a year.
- Retaining mercury production at the present level, goal figure is 600 tons per year.
- For antimony – maintenance of production depending on volume of raw materials supply.
- Production of copper and tin could not be considered as an object of development.

As far as basic course will be implemented, mining industry share in the GDP must amount to 10%.

3) Stage-by-stage promotion of mining industry

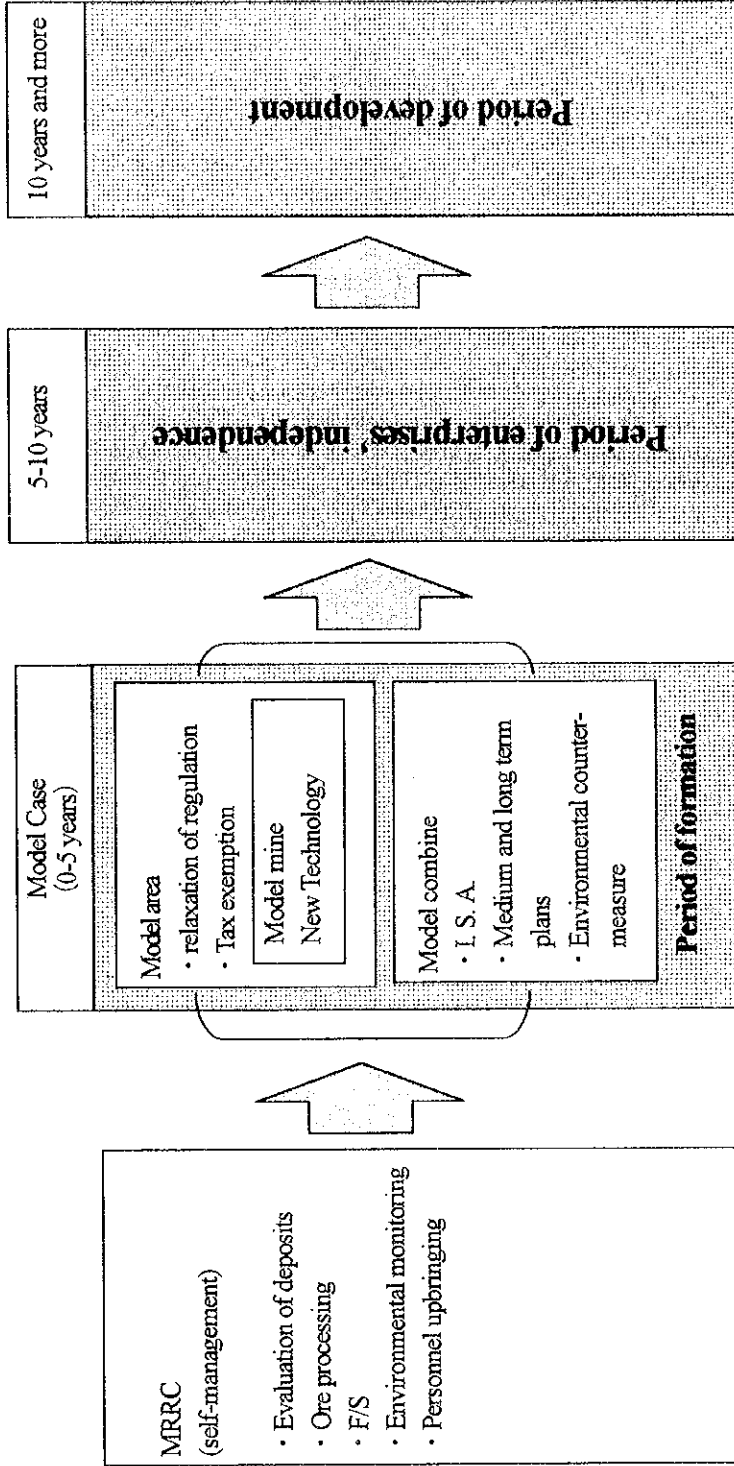
Breakdown of mining industry development process into 3 stages is given below.

- ① Industry formation : state's interference degree is relatively high (0-5 years)
 - Rationalization of combines (structural reformation)
 - Improvement of legislative and tax systems, introduction of international standards of accounting
 - Introduction of mining technologies, research on ore processing
 - Personnel training (evaluation of projects, production management)
 - Forcing introduction of foreign investments and national capital
- ② Period of enterprises' independence : degree of interference of the state is not high (5-10 years)
 - Privatization of combines (profit ensuring)

- Final establishment of legal and tax systems and accounting norms
 - Establishment of mining technologies and development of ore processing technologies
 - Establishment of a single body on industry management and the practical use of new personnel.
 - Increasing and broadening the sphere of activity of foreign and national capital.
- ③ Period of development : State has only indirect influence upon the industry (10 years)
- Free mining activity to operate under market conditions

Image of Promotion of Mining Industry

- Revival and promotion of economy and self-support
- Uprising of local economy



For ensuring sustainable development of mining industry

- Systematizing environmental protection
- Development of small and medium size deposits (especially gold)

Figure 4-1 Image of Promotion of Mining Industry

4-2 Forcing ore exploration and development of deposits

4-2-1 Accelerated development of gold deposits

① Forcing development of small and middle-size deposits

Foreign investors have very low interest to the development of small and middle-size deposits. It is important to take measures that will stimulate interest for development of their small and middle-size deposits through the participation of foreign and domestic capital.

② Forms of development

- Large (gold reserves of 70 tons and more)
Foreign capital/"Kyrgyzaltyn"(State), other state mining enterprises
- Middle-size (20-70 tons)
Foreign capital/national capital (State + regional administration)
- Small deposits (5-20 tons)
National capital/local administration/private capital
- Mini deposits (under 5 tons)
National capital (local administration/small teams/private persons)

③ Measures on acceleration of ore exploration and development of deposits

In order to accelerate the process of ore exploration and development of deposits, it is necessary to define a model region which has a potential for such activity. From this point of view, it is necessary to select model mine and work out policies for the introduction of technologies that promote development of the mining industry. Consideration should be given for increased national support for geological expeditions of SAGMR and the issue of unemployed workers of the combines and other mining companies.

4-2-2 Prospective areas for implementation of geological exploration

① Prospective small deposits

Table 4-2-1 Promising Small Scale Deposits

Deposit	No.*	Location	Au amount t (potential)	Au grade g/t	Stage	Remarks
1 Kumberi	37		2.2 (8)	50	Detailed	W-Au ore
2 Buridenet	56	Northern Tien Shan Mountains Karakiche, Solton-Sary	0.7 (3)	17	Detailed	
3 Sarasai	93		0.5 (1)	12	Detailed	
4 Jamgyr	24	Middle Tien Shan Mountains Chalkal	15 (20)	12	Detailed	Infrastructure problem (remote)
5 Komator	26	Northern Tien Shan Mountains Akhuz, Volzee	6.6 (10)	7	Detailed	
6 Kuramjytau	16	Northern Tien Shan Mountains Severo, Kyrgyz	8.3 (12)	10	Detailed	Includes As 0.1-1%
7 Karakiche	55	Karakiche, Solton-Sary	1.4 (2)	12	Detailed	
8 Chalkkuyruk	10	Southern Tien Shan Mountains East Alai	5.5 (100)	18	Detailed	As>1%
9 Karakazyk**	8		10 (40)	14	Detailed	Infrastructure problem (remote)
10 Chakush**	28	Southern Tien Shan Mountains Alai	3.5 (30)	11	Detailed	As>1%
11 Alfyn Jylga**	31		10 (30)	8	Detailed	Survey by MMAJ

* No. corresponds to the # of deposit in appendix

** MMAJ-State Agency on Geology and Mineral Resources Cooperation Area Survey

② Model area

If we take existing combines, including such large combines as Kumtor, Jeruy, Taldy-Bulak Left-Bank, as a starting point, we will have a choice of approximately 10 places as model areas (Figure 4-2-1, Table 4-2-3).

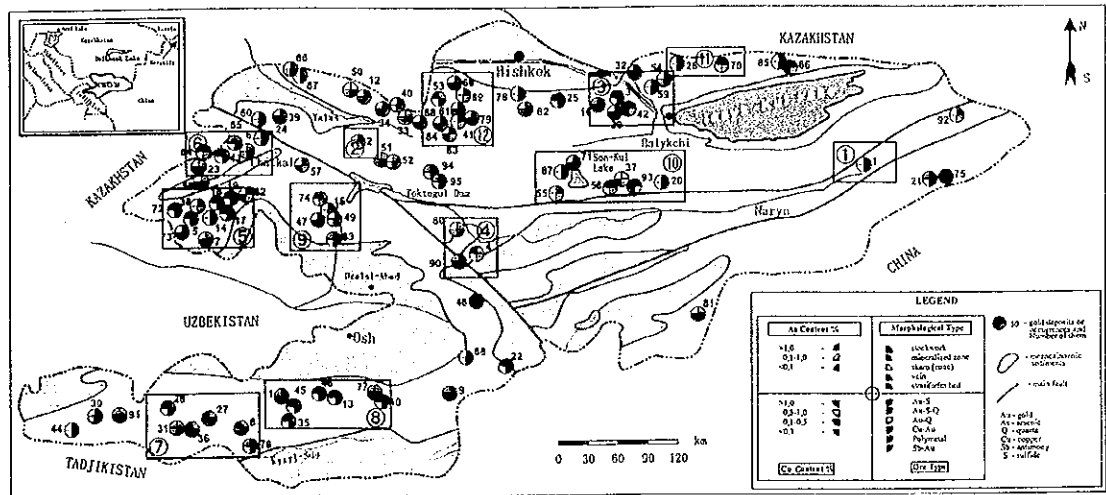


Figure 4-2-1 Model area (draft)

4-2-3 Basic plan of geological exploration

- Goal is during a 10-year period to develop 200 tons that will be derived by investment of foreign capital 150 tons (15 tons/year), and another 50 tons (5 tons/year) – from national capital.

Table 4-2-2 Basic Design (draft) of Exploration

		2000	Raising Private Capital	2010	Growing Mining Industry	2020	
For Cap.	Kumtor	①	*160 t		*160 t		
	Jerui, Taldybulak	② ③	F/S·Dev.	*45 t	*60 t		
	New deposit developed by foreign investor	④ ⑫	Expl.	F/S·Dev.	15 t	30 t	
			Expl.	F/S·Dev.	10 t		
			Exploration			F/S·Dev.	
	Production subtotal		220 t (22t/yr)			260 t (26t/yr)	
Private Capital	Makmal, Karakiche, Solton-Sary	④ ⑩	Expl.	8 t	12 t		
	Other (including territory belonging to foreign investor)	⑥ ⑧ ⑨ ⑪ ⑫	For. Ent. Territory	Dev.	Expl. Dev.		
	Alai area	⑦	5 t		10 t		
			Expl. Dev.		Expl. Dev.		
	Tereksai area	⑤	5 t		15 t		
			Expl. Dev.		Expl. Dev.		
	Alluvial gold		2 t		3 t		
Production subtotal		20t (2 t/yr)			40t (4 t/yr)		
Total production amount		240t (24 t/yr)			300t (30 t/yr)		
As treatment tech. dev.		→			Incl. As Dep. Dev. · Prod.		
Proven ore reserves		200t For. Inv. 150t Private 50t			300t For. Inv. 220t Private 80t		

○ indicating model area No. of Table 4-2-3 * Conjectured Amount of Production

4-2-4 Model mine

To promote the mining industry of Kyrgyz Republic, a large-scale underground mine is necessary. Model mine development through cooperation with the Mineral Resources Research Center (see chapter 4-2-5) would also support ore exploration and development of neighboring small deposits and ore occurrences (Figure 4-2-2).

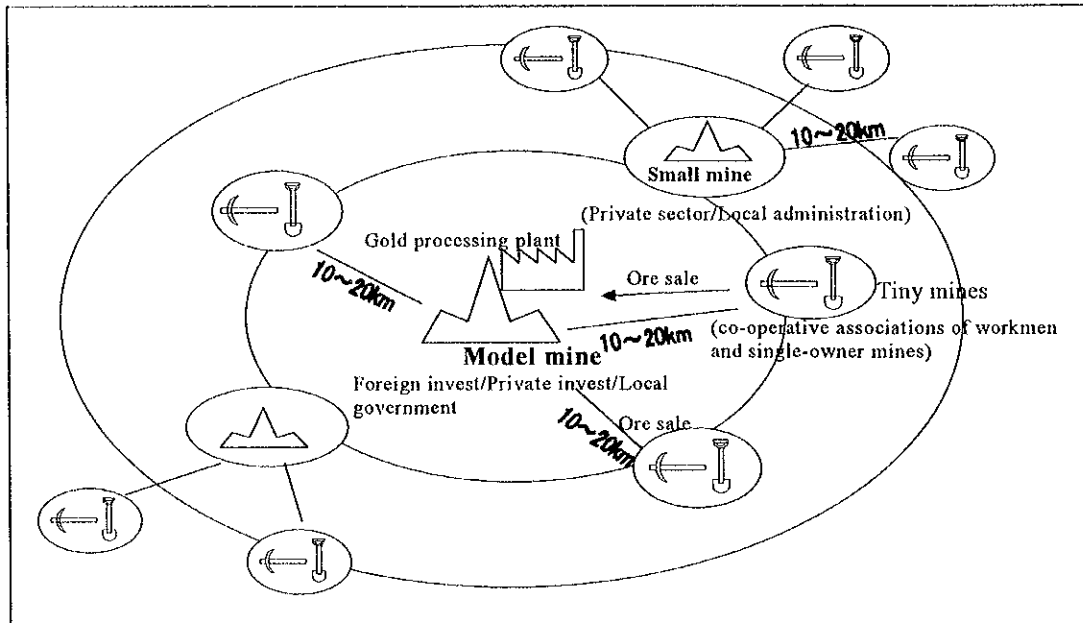


Figure 4-2-2 Model mines and development of deposits in their vicinity

On model mine, by general opinion, the following should be foreseen:

- Introduction of latest mining technologies
- Training of technical and management personnel
- Model management control on the basis of international standards of accounting
- Advanced environment control system

The state shall provide the model mines with assistance in the form of tax exemptions, expedited financial procurement, etc. for a specific period. It is proposed to introduce in underground mines trackless mining method which are most popular in the world. This technology should be transferred to other mines by making inspections on sites and holding seminars and, where successful, application of such method will be demonstrated.

4-2-5 Mineral Resources Research Center

Mineral Resources Research Center is established in purpose of technical assistance to the promotion and development of small and middle-size deposits in Kyrgyz Republic. Simultaneously with mining complex support the Center will support, on orders of the state and private enterprises, environment protection, i.e. this structure will be able to exist independently. The Concept of the Mineral Resource Research Center is shown on Figure 4-2-3.

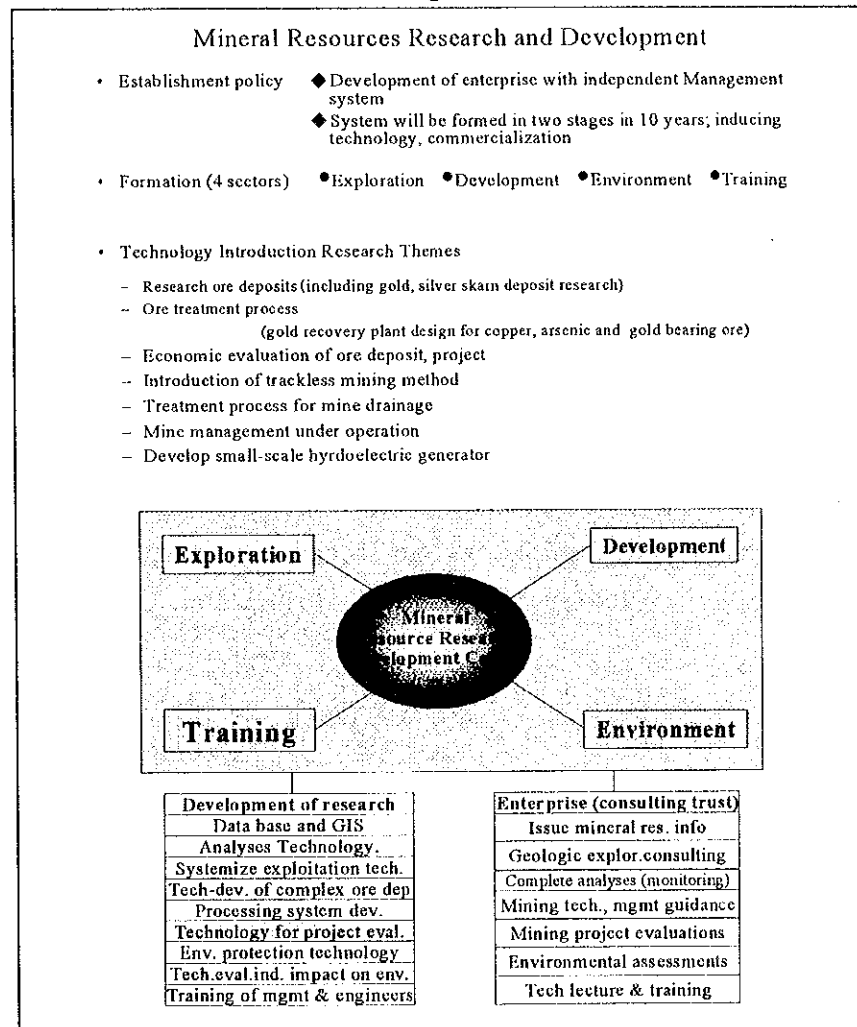


Figure 4-2-3 Mineral Resources Research and Development Center

Mineral Resources Research Center's activity will consist of 4 directions: geological exploration, development, environment and training (improvement of skills). Center will have equipment on environment monitoring and will be able to utilize it by the contracts with small and middle-size enterprises. Additionally, it can provide technological support in the field of designing environmental controls, and implementation of environmental plans. The Center will also deal with personnel training for implementation of environmental control.

4-2-6 Mining industry promotion and environment control

Although it is essential to implement promotion of mining industry in harmony with the environment it is recognized that the installation of equipment, preventing environment pollution and other protection measures will require immediate large investments. However, it is late and environment pollution is spreading widely. Also, when closing the mines large funding continues to be necessary, even after the mine has been stopped producing, in order to carry out continuous control of sewage, wastes. Financial resources of small and middle-size mines are very limited, thus they are not capable of environment control implementation by its own technical means.

In order to promote mining industry it is necessary to pay attention to the following aspects of this industry:

- ① Simplification of bureaucratic procedures
 - Bureaucratic procedures should be simplified in order that the Ministry of Environment Protection can consider all the applications. This can be accomplished by making Ministry of Environment Protection responsible for matters related to the environment.
 - All discussions with other ministries and organizations concerning ecology will be conducted by the Ministry of Environment Protection.

- ② Improvement of environment protection system
 - The environment protection Fund should provide incentives for taking measures for environment protection by rendering assistance, in the form of subsidies, to renew old equipment, thereby, preventing environment pollution and by implementing low interest financing of such measures.
 - In the case that all the environment protection norms are observed, exemption from payment of tax on environment protection or its decrease is foreseen.

- ③ Introduction of accumulation system of environment protection
 - A system of accumulations to support the measures on environment protection is introduced. Use of accumulated funds is allowed only for the certain purposes, and they are subject to obligatory repayment.
 - Objects dealing with mining activity should annually accumulate certain non-taxable sum which will be used for liquidation of pollution in the area of mining activity, or for rehabilitation of this area after the mine is closed (reclamation).

- The taxes on waste production during the mine activity: dumps, precipitation ponds etc. must be collected. They should be accumulated and used to mitigate the damage caused by these wastes and poisonous materials they contain. The difference in calculation of taxes for environment protection sometimes occur e.g. The per unit volume of poisonous materials in waste regardless it is necessary to stimulate environment protection, by, for instance, decreasing the tax rate in those places where control of dumps and precipitation ponds is carried out properly.

- ④ Technological assistance to the small and middle-size mines
- If necessary (chapter 4-2-5) the MRRC should implement the work on environmental protection, for a low fee for small and middle-size mines.

4-2-7 Support in financing of small and middle-size mines

① Fund of ore exploration and development

If available sources were used for the establishment of a Fund for the promotion of geological exploration and development, a low interest crediting (approximately USD 2 million/yr) organization could be created. Sources of funds would be as following.

- Funds received from Kumtor (part belonging to Kyrgyz Republic)
- Currently existing Fund of promotion of geological exploration (royalty)
- Part of the funds from tax collection on its mining industry (tax on income of combines, VAT)

Regardless of the source of funds and their distribution the MRRC would evaluate proposed projects from a technological and economic point: perspective and assist in the overall project.

② System of mining allotments

To increase the attractiveness of development of underground resources, it is necessary to give the mining allotments based on leases with payment depending on the production volume.

③ System of leasing of facilities and equipment

A system of granting leases on facilities and equipment that soften the burden of such expenses during the development period is being created.

④ System of ore purchasing

Purchasing by the state through the model mines, of ore which is produced by the small and mini enterprises or from development activities which are performed simultaneously with ore exploration.

⑤ Introduction of project financing

In contrast to the principle of Governmental guarantees, project financing does not require Governmental guarantees and debt is repaid by the project from profit only (cost of sold products) thus, this is a method of financing when national foreign debt is not increasing, or when the country gets funds for implementation of large projects: construction of roads, power stations, water pipelines etc.

4-2-8 Openness of information and scientific and technical exchange

Presentation to the international community of information on the mining sector and data on all the social and economic issues for the purpose of information exchange with the advanced countries having highly developed mining industry.

① Establishment of information service on mineral resources (in State Agency on Geology)

- Computers and other equipment on information, installation of software.
- Opening of homepages in addition to the information in Internet.
- Publication of advertisement booklets introducing mineral resources of country, it's legal and tax systems in mining industry. its structure, function and statistical data on mining industry etc.
- To make re-edition and English translation for internal use into English and make it accessible proceeding from the certain norms.

② Cultural relations with advanced mining countries

4-3 Restructuring of combines

To improve this situation, the combines should undertake the following steps.

- Designing medium- and long-term plans (plan of sales, plan of ore supply, production plan, and personnel plan, plan of financing).
- Introduction of international standards of accounting (financial analysis, evaluation of assets, examination of profitability by each division of production separately)
- Reduction of costs (improvement activity, application of incentives)
- Strengthening of environment control system

1) Kara-Balta combine

Since we have no detail information on present state at tin deposit Toldoboy belonging to the Kara-Balta combine, we will not consider this deposit here.

2) Makmal deposit

- ① To restore the mine as a small one with trackless mining method.
- ② The gold processing plant should buy and process ore from neighboring small deposits and ore occurrences as they are developed.

3) Solton-Sary

- ① Introduction of trackless mining method in underground mining.

4) Khaydarkan combine

- ① Estimation by each mine of necessary amount of opening adits by each block, calculation and evaluation of the grade.
- ② The following 3 variants may be proposed for combine's rationalization(structural reformation)

	Variant 1	Variant 2	Variant 3
Mine No.1	At present level	small increase of production, employment, development of production, stripping works	Not considerable increase of production, employment, development of production, stripping works
Mine No.2 (fluorite, antimony, mercury)	At present level	Suspension, personnel reformation, production of fluorite on another deposit	Suspension, production of fluorite on another deposit
Small and middle-size gold deposits			Promotion of ore exploration and development, personnel employment, activation of idle assets

③ Introduction of the newest laboratory equipment, organization of technical training, and strengthening of environmental control system.

5) Kadamzhay combine

① A thorough financial analysis to clearly define the profitability of each separate production activity

② To develop a plan for ore supply that would determine necessary volumes of antimony metallurgical processing.

- To perform economic evaluation of the mines, including undeveloped mines, separately from the metallurgical processing plant

- To define prospects of ore supply, paying attention to the procurement condition of the imported raw materials.

③ To arrange metallurgical processing of copper-gold ore in addition to the processing of antimony-gold one.

④ To conduct a study of environmental conditions around the mines and metallurgical processing facilities and work out the necessary measures on environment protection.

4-4 Support system of mining industry

4-4-1 Establishment of unified body on mining industry management

1) Functions of unified constitution on mining sector

For promotion of mining industry, as well as dealing with reorganization, liquidation and alliance of currently existing bodies a responsible state body, with an appropriate constitution that defines a unified structure, should be established.

Table 4-4-1 Obligations of unified body of mining industry management and its comparison with currently existing bodies

Obligations and authorities	Existing bodies	After new body establishment	
		Management body	Coordinating body
Budget of mining industry	SAGMR, "Kyrgyzaltyn", MOF	Sector of management	MOF
Issuing of licenses for mining Land use right	SAGMR, Local government	Sector of management	Agency on land use
Planning and design of mining policy (legislation and tax system)	SAGMR, MOF, MITI, Ministry of Justice	Sector of planning	Presidential Administration, Prime-Minister Office, MOF
Promotion and Supervision of mining development plans	SAGMR (geological expeditions), Department of industrial policy of MITI	Sector of promotion	
Legislative and tax systems		Sector of planning	Presidential Administration, Prime-Minister Office, MOF
Collection of geological data base, its control, evaluation and analysis of deposits, collection and analysis of mining industry information	SAGMR, State Committee on reserves, State Committee on Statistics	Sector of investigations	State Committee on statistics MITI
Short- and long-term lending	MOF	Sector of financing	MOF
Foreign capital introduction	State Committee on investment and economic aid, Agency on foreign investments, SAGMR	Sector of financing	State Committee on investment and economic aid, Agency on Foreign investments
Safety on mines	Gostech-nadzor	Sector of public safety	Ministry of Labor and Social Security Gostech-nadzor
Environment protection	Ministry of Environment Protection	Sector of public safety	Ministry of Environment Protection
Development of technologies	SAGMR, Academy of Science	Sector of technologies	Ministry of Science and Education, Academy of Science

2) Establishment of Committee on mining industry policy (top priority measures)

Since establishment of unified body on mining industry management needs detail consideration and long preparation period, it is necessary to establish as a priority measure a Committee on mining industry policy which will be responsible for working out the mining industry development plan and conditions for its implementation.

3) Reorganization of State Agency on Geology and Mineral Resources

When reorganizing SAGMR, it will first be necessary to define the state's role in geological exploration. The State itself doesn't conduct geological activity, but rather promotes exploration and development. In particular, it is proposed that the State Agency on Geology and Mineral Resources should play an active role in encouraging the development of small and middle-size deposits, and should be being renamed into the Agency on Geology and Development of Mineral Resources, with strengthening of its development function.

The following should also be considered: the administrative portion of the Agency on Geology and Development of Mineral Resources (proposed as a draft) would be the basis for the establishment of a new unified body on mining industry management. The production subdivisions of the Agency would become an independent and private company dealing with geological exploration and development and being private sector basis for the mining of useful mineral deposits. Subdivisions dealing with fundamental geological investigations and science research would be transferred to structurally reformed organizations on prospecting and surveying exploration of useful minerals and Mineral Resources Research Center as extraministerial office of uniformed mining organization (Chapter 4-2-5).

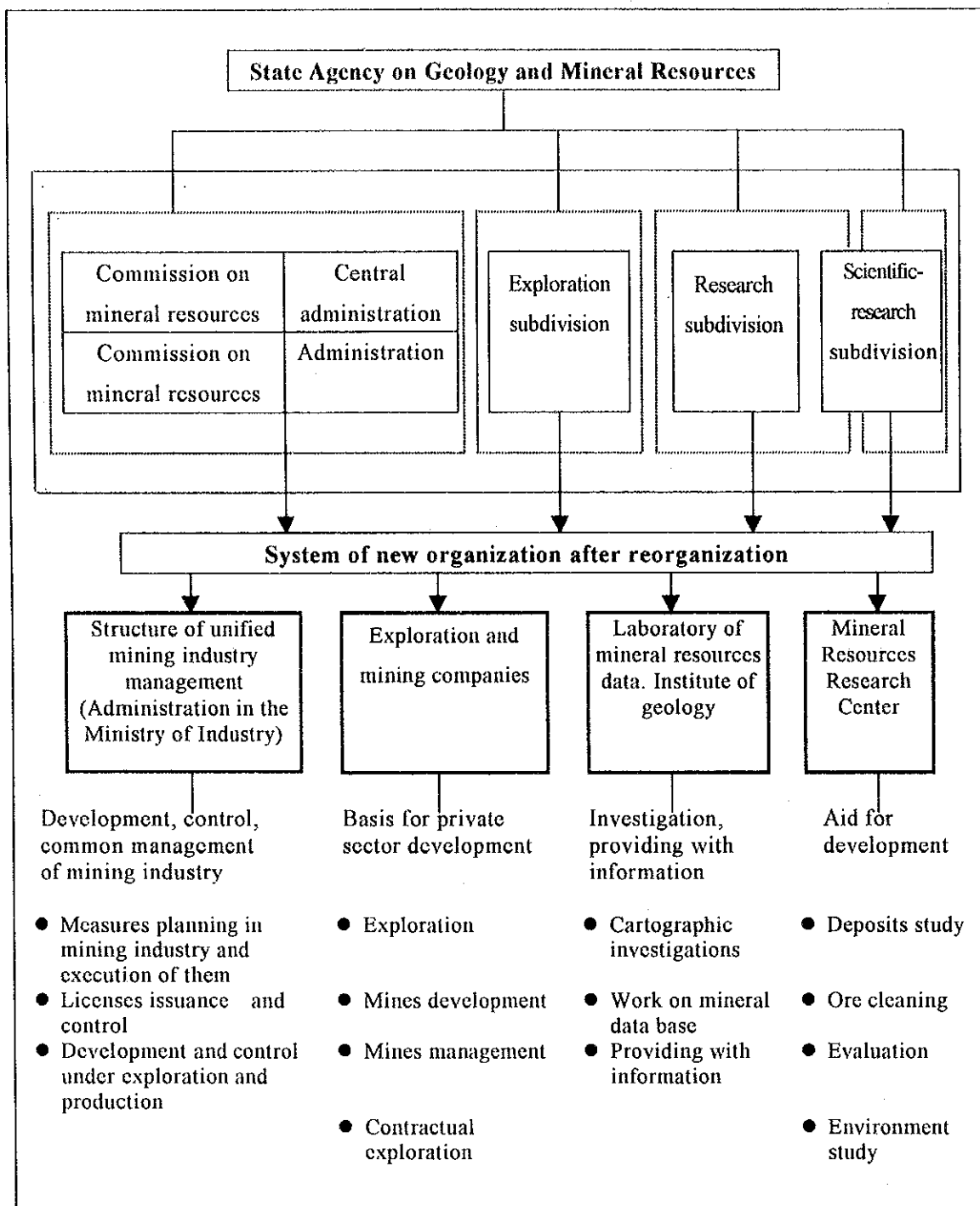


Figure 4-4-1 Project of SAGMR reorganisation

4-4-2 Support of mining industry with assistance of legislation and tax system

If we look at industry through the eyes of investors, this industry which mines ore from unlimited Earth's subsoils, needs a long preparation period before development and large investments; the repayment period is high and investment risk is also very high. For development and promotion of the mining industry it is extremely important to work out various financial issues, such as credit and tax benefits to decrease investment risk, thus, it will make investors more interested in development of underground resources.

1) Regulation of legislation

- Items of getting different permissions and approvals. It is necessary to simplify its procedures for inquiries and application submission by designating only one department as a reception counter with the right to accept such applications. It is necessary to reduce the consideration terms.
- Approval of reserves Under the market economy conditions, development of mines is a personal responsibility of the investors, and the investor himself must define the reserves which he is going to develop. It is necessary to change the system of reserve approval by the State. Similarly, the strategic control of available mineral resources system is needed to transfer to the system of reports submission by the investors dealing with development.
- Prohibition of selective mining, balance reserves Under the market conditions investor himself must think about the balance reserves, state support is limited to issues of safety, environment problems etc.
- Control of mining allotments In most countries it is required to define the unit of the mining allotment (smallest allotment) by longitude and latitude. In such form it will be much easier to control mining allotments. Additionally, it is necessary to introduce limitations by area of received allotments to prevent stagnation in geological exploration due to the monopolistic ownership of huge mining allotments (by the way, idea of depth is not necessary at all).
- Land use right In order to promote mining industry, keeping in mind the importance of regulation of this matter between the two types of powers, first priority should be given to the development of mineral resources. By introducing a certain fee for land use it is possible to promote ore exploration in vast region.
- Natural parks Through differentiation of the parks at differing levels we should consider the possible creation of development zones on park territory based on condition of environment protection principles.

- Safety norms They should be reviewed under the technical progress and new technologies introduction.

2) Taxation system

- Royalty In many countries there is a system of taxation by royalty of mining products. Usually, the rate of royalty is 1-3% of sales volume. Kyrgyz Republic also needs to consider a similar principle of royalty calculation.
- Road tax and Emergency Situation Fund If Road tax is actually intended for the roads, it should be imposed on the transport means and fuel. Alternatively, if the Fund of Emergency Situations is a State-based Fund in conditions of economic confusion it is time to abolish such a fund.
- VAT It is necessary to consider a possible exemption of mining-exploration activity from VAT payment, and a 50% reduction for the development of small, middle-size and model mine activity proposed in this report.
- Customs duties At the present time customs duties on import of equipment for mines operation are not provided. This principle of exemption also covers equipment for exploration and devices and equipment for the introduction of new technologies.

3) Policy on support of mining industry

- System of privileges for large foreign investments In cases when mine development requires large investments, especially when foreign capital is necessary, it is important to clearly resolve this issue clearly through negotiation.
- System of depletion This system of depletion exploration- discovery requires the advance accumulation of funds in the Fund of Ore Exploration. In respect to these deductions the tax support measures are used. These funds spending is limited by the exploration costs.
- System of repayment of ore exploration costs Expenses on exploration costs are considered as assets, and after the deposit's development their gradual repayment is carried out.
- System of accelerated depreciation The purpose of rapid recoupment of funds spent for purchase of equipment, is to soften the burden of payment of interests for loan during the early phases of the enterprise's operation. The repayment period (number of years) is especially reduced.

- System of money losses carrying-forward In order to ensure a stable enterprises there is a necessity to carry forward losses for a certain period. An understanding of the articles related to carrying forward losses is necessary.
- System of accumulation on natural calamity prevention It is mentioned in chapter 4-2-6 “Promotion of mining industry and environment control”.
- System of support of combines reconstruction Assistance for combines reconstruction must be provided in the form of postponed increases in the cost of electric power and fuel (subsidy), abolishment of royalty, reduction of VAT and profit tax, granting low interest credits, i.e. it must be supported by budget as well as by fiscal and financial policy.

4) Financing

See chapter 4-2-7 “Financial support of small and middle-size mines”

5) Environment

See chapter 4-4-3 “Environment control system”.

4-4-3 Environment control system

To ensure sustainable development of the mining, its harmony with an environment is essential. It is necessary to strengthen the system of control measures on environment pollution through enhanced monitoring system, personnel training etc. In addition, it is required to implement the principle of environment data availability, as well as raising the consciousness of the whole society with respect to environment protection. Concept of environment protection norms and control is shown on Figure 4-2-2.

1) System of norms on environment protection and control

① Principle of distribution of expenses burden on the environment

Burden of expenses on environment control is divided into the burden of polluter and burden of beneficiar receiving an advantage.

② Environment control on the basis of limitations

The best way to carry out efficient control of the environment is to create limitations on the basis of precise differentiation of norms for environment protection and exhausting norms.

③ Raising the level of consciousness in the matter of environment preservation

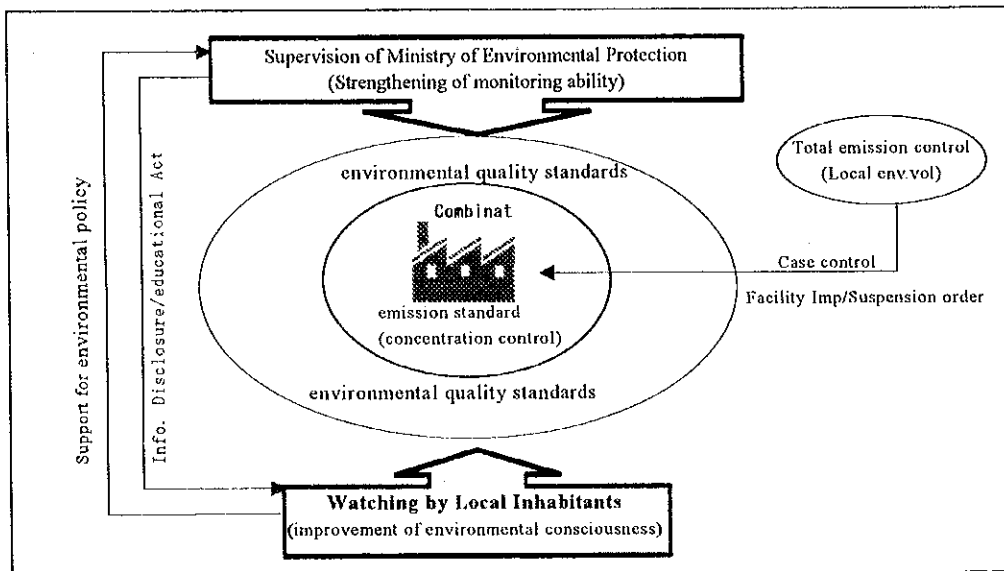


Figure 4-4-2 View Environmental Control and Management

2) Strengthening system of environment control

① Support of environment control on small and middle-size enterprises (mines)

- Mineral Resources Research Center (chapter 4-2-5) will undertake control of environment on small and middle-size enterprises (mines) with low cost.

② Strengthening monitoring system of Ministry of Environment Protection

- Liquid chromatography (it is possible to work with it on sites)
- ICP (high accurate analysis of microscopic doses of heavy metals is possible with it)

4-4-4 Personal training

To ensure rapid promotion of the mining industry it is necessary to train the personnel to meet the requirements of a market economy system and introduce new mining technologies.

- To arrange real education of domestic specialists on management by introducing medium- and long-term planning at the combines, conducting financial analysis on the basis of international standards of accounting, and secure the assistance of foreign advisors on production management.
- To educate technical specialists by investigation and estimation of concrete subjects in the Mineral Resources Research Center.
- By sending the specialists to the model combines and focusing their work in real development and production in order to train practical workers: managers, technical specialists, and masters.
- To train personnel to have international approach to problems by introducing them to international training with an assistance of international organizations.
- To push personnel to take a part in seminars by international organizations, and the Kyrgyz Mining Association because such exchanges increase professional skills.

4-4-5 Privatization

Rapid privatization of mining industry, which has many production problems, and on combines causes many difficulties. As usual, the following is most important for privatization.

- Combines must work out medium- and long-term plans paying attention to the system of reformation support, and precisely define the production situation.
- Combines must systematize and re-estimate their debts and assets.

- In case of privatization it is necessary to define responsibility of combine in management.
- Regarding investors which take a part in privatization of the state enterprises, preferential treatment is essential.

5. Plan of Actions

① Plan of actions on mining industry promotion

Concrete explanation of these measures and implementation program are given in the Table 5-1 "Plan of actions on mining industry promotion"

② Project of support by international organizations (draft)

Taking into consideration the present situation of the mining industry in the Kyrgyz Republic, it is a good idea to underline in our plan of actions the following articles which requires support from international organizations:

- Mineral Resources Research Center
- Modernization Plan of Khaidarkan combine
- Modernization plan of Kadamzhay combine
- Purchase of laboratory equipment for the Ministry of Environment Protection
- Purchase of facilities and equipment for mining (for granting on lease)
- Advisors on mining policy
- Introduction of computer processing on accounting
- Advisors on mining industry management

③ Forecast of gold mining industry development

In development of large-scale mines, the main role is given to foreign capital. The development of mini, small and middle-size mines is based on the domestic capital.

- By the forecast of gold mining development, gold production in the Kyrgyz Republic will reach 30 tons after 15 years, 7000 people will work in the industry (Figure 5-1).

Table 5-1 Plan of Actions on Mining Industry Promotion

Plan of actions by items		1st year	2d year	3d year	4th year	5th year	6-10 years	11-15 years	CONTENT
ore exploration and development	mainly support of development of small and middle-size enterprises	determination of model area	○—★						Approximately 10 areas from the regions with potential for ore exploration are selected. Model areas will have a preferential treatment. Ore exploration is carried out at the same time with development.
		selection of model mines	○—★						Introduction of non-rail haulage method, creation of experimental management, environment control, personnel training, simultaneously with development of neighboring deposits.
		working out of basic plan of ore exploration		○—★					Acceptance of concrete plan of ore exploration, mainly in model areas.
		creation of Mineral Resources Research Center	○—★						Introduction of GIS system, system of airphotosurveying analysis, and devices on ore processing study. Selection of areas with potential for ore exploration, evaluation of deposits, ore processing study and projects estimation is implemented.
		establishment of companies on ore exploration and development		○—★		privatization	▶		
reformation of combines	Modernization plan of combines	Kara-Balta	○—★						A possible development of tin deposit in Toldoboy is considered. Continuation of development of Taldy-Bulak Left-Bank deposit.
		Makmal	○—★						Consideration of mines restructuring and development of neighboring deposits by introducing non-rail haulage mining method.
		Sollon-Sary	○—★						Consideration of accelerated development by introducing non-rail haulage mining method.
		Khaydarkan	○—★						To accurately separate the profits of Mine No.1 and Mine No.2 as rationalization and consider possible close of Mine No.2 and development of gold-bearing deposits in vicinity.
		Kadamzhay	○—★						Precise separation of profits of mine and metallurgical processing plant. Study of rationalization depending on antimony raw materials supply. Consideration of possible processing of copper-gold ores.
support of combines reformation	normalization of prices for electric power and fuel decreasing and exemption from the royalty and profit tax support of crediting	○—★							Restraining of prices for electric power and fuel in accordance with combine's modernization plan.
		○—★							To decrease or exempt the taxes: royalty, profit tax, VAT, and others in accordance with the combine's modernization plan.
		○—★							To consider the possible arrangement of long-term cheap credits in accordance with the combine's modernization plan.
legislative and tax systems	legislative restrictions	revision of law on underground resources	○—★						Simplification of applications submission procedure, revision of proved reserves, prohibition of selective mining, balance reserves, control of mining allotments, land use rights, natural parks and safety norms.
		System of taxation in mining industry	revision of royalty rate	○—★					To consider the possible royalty charging regardless of ore type based on principle of 2% from sales volume.
	introduction of accelerated depreciation system	○—★							To establish the system of accumulated reserve Fund being exempt from paying taxes, in order to promote ore exploration, taking into account big depreciation.
		depreciation of ore exploration costs	○—★						To include the costs on preparation to deposits exploitation into fixed assets with their further depreciation.
		introduction of accumulation fund system to prevent public damage	○—★						Accumulation Fund system to support the measures on environment protection. Payments from this Fund are limited by the needs of environment studies and research works.
		ordinary taxation	revision of road tax and payments to the Emergency Fund	○—★					
	VAT		○—★						Exemption from payment of VAT on ore exploration. To study the possible double decrease of taxes charged on development of small and middle-size mines.
	indirect taxes	○—★							At present time imported production equipment is not taxable. It is necessary to support this system and expand the articles being exempt from paying taxes.
		taxes on use	revision of payments to Environment Protection Fund and other similar payments	○—★					
	system of privileges	benefits for large mines	○—★						
carrying-over losses		○—★							Present system is still existing, further beneficial measures are under consideration.
financing	support of large projects on development	introduction of project financing	○—★						To put together development of mines and promotion of hydro power engineering and consider the possible introduction of project financing.
		support of development of small and middle-size deposits	establishment of a Fund on ore exploration and development	○—★					To consider the possible creation of Fund of long-term cheap financing. To use as a source of funds the circulating capital of Kumtor, royalty, part of taxes received from mining industry and other taxes.
	introduction of leasing system	○—★						Creation of system of equipment leasing for development. Leasing of idle equipment of geological exploration expeditions and combines and its sale.	
	ore purchasing by the State	○—★						System of sale of produced ore to the State for cash through the model combines.	
management structure of mining industry	measures on mining industry promotion	creation of a Committee on mining industry policy	★						Since establishment of unified body of mining industry management requires a long time, it is necessary to create a Committee consisting of present Steering Commission members. Goal of Committee is rapid promotion of mining industry.
		establishment of a unified body of mining industry management	○					★	Through strengthening of function of mining policy plans working out, based on the administrative part of SAGMR, create a new unified body of mining industry management.
	reformation of Agency on Geology and Mineral Resources	independence of geological exploration subdivisions	○—★						To establish the companies on ore exploration and development dealing with independent mining on the basis of reformed geological exploration expeditions.
		separation of geological exploration from a system	○—★						By transferring the functions of Scientific-Research Institute of Mineral Resources to the scientific-research subdivisions of SAGMR, to implement cartographical exploration and other fundamental investigations.
		separation of scientific-research subdivisions from a system	○—★						Part of scientific-research subdivisions of SAGMR is included in the Mineral Resources Research Center.
strengthening of control system of environment protection	creation of a laboratory of data on mineral resources (openness of information)	○—★						By creating in SAGMR laboratory on mineral resources, to open domestic sites in Internet and create a software system. To make English translation of documents.	
	Participation of Mineral Resources Research Center in environment protection		○—★					Implementation of the contracts on environment control with the small and middle-size mines, support of environment control at enterprises.	
	strengthening environment monitoring system	○—★						Introduction of liquid chromatograph and ICP at head office of Ministry of Environment Protection, that will considerable increase the monitoring capacities.	
environmental education of population	○—★							Ensuring of access to environment data within the permissible limits to make such data open to public.	
	introduction of international standards	introduction of computer software for accounting		○—★					For better understanding of financial situation of combines, in order to take the proper management decisions, it is necessary to introduce computer software for conducting accounting based on international standards, and management information system.
personnel training		guidance and training of specialists	advisors on mining industry policy	○—★					
	technical advisors on mining industry		○—★						Specialists of management of measurement and laboratory equipment and specialists on management of non-rail haulage mining.
	advisors on mining industry management		○—★						Use of the same specialists, if necessary, to make an analysis of combine's operational problems and working out of modernization plans.
	training abroad	○—★						Use of system of invitation of specialists from international organizations, simultaneous training of local specialists in the countries with highly developed mining industry. Active participation in foreign seminars on mining industry.	
revision of plan of actions on mining industry promotion			○—★						To make a revision of the mining promotion plan every 2 years, 5 years.

○ - beginning consideration of content
★ - decision on content

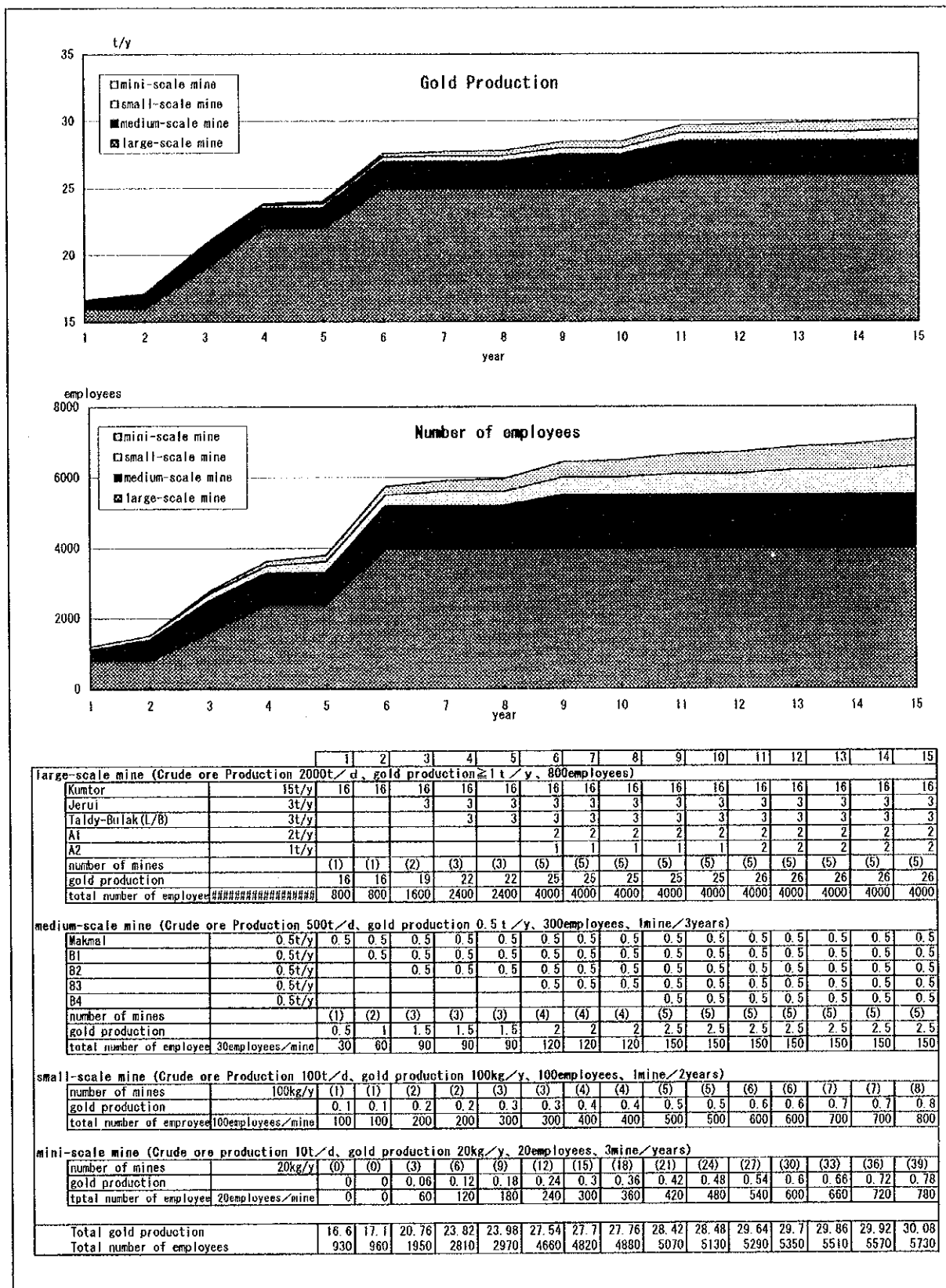


Figure 5-1 Forecast of gold mining industry development

JICA