

Draft

**The Action Plan on
Production of Primary Mercury and its impact on the environment in the Kyrgyz
Republic**

**Bishkek,
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Conclusions and recommendations

1. Executive summary

UNEP Governing Council concluded at its 22nd Session in 2003 that there is sufficient evidence of significant global adverse impacts from mercury and its compounds to warrant further international action to reduce the risks to human health and the environment. In response to this, UNEP established a mercury programme within UNEP Chemicals in 2003, an ad hoc open-ended working group (AHOEWG), which uniting representatives of the governments, the regional organizations of economic cooperation and interested parties, to review and assess options for enhanced voluntary measures and new or existing international legal instruments was established.

Assistance to the Kyrgyz Republic in the problems solving of the environment and health of the population, related to the production of the primary mercury, and also in a socially responsible gradual reducing of mercury production on the operating mines should be one of the nearest priorities within the limits of the Global partnership of UNEP on mercury.

The modality and overall approach for implementing the comprehensive mercury policy framework is not clear at this time. However, it is possible to assume, that within a 10-year time frame which will severely restrict the long term viability of mercury mining and that accessing existing sources of mercury is likely to become a preferred source of mercury over new primary mined mercury while mercury is phased out.

In relation to that, international organizations are currently conducting preparation works on the development and further signing of an international convention on reduction of primary mercury mining on the global scale.

Kyrgyz Republic is the only country in the world that continues mining and production of primary mercury at the KhMJSC (Khaidarkan Mercury Joint-Stock Company) in Batken region. Considering preparatory works that are being conducted on the convention, banning production of primary mercury in the world, the issue of the further activity of the plant acquires extremely important value for the Kyrgyz Republic.

Preparation of the effective Action Plan, that will make possible to contribute to the solution of the environmental, social and economic problems, that are related to the primary mercury production, demands a complex approach that will include: an analysis of the current condition and trends of mercury industry in the Kyrgyz Republic; the review of the legal regulations, institutional frameworks and program documents, concerning mercury production

management and control, and the impact on environment; an analysis of environmental problems, related to the current and past activity of mercury production; preparation of the list of alternate options of economic development and recommendations on.

Based on the materials of the studies by international and national experts, it is possible to offer a number of priority measures on reduction of negative impact on environment, related to the mining of primary mercury at KhMJSC, such as: improvement of the national legislative base, of the standard specifications on industrial pollution, of law enforcement practice, of environmental monitoring, and introduction of adequate practices of inventory of emissions and payments for polluting environment with mercury, assistance in dissemination of the safer ways of agricultural management, analysis of environmental aspects of the activity of KhMJSC and identification of the priority of economic alternatives for development of Khaidarkan area.

2. Introduction and preconditions

In connection with the necessity of systematization of the Action Plan, directed at the risks reduction, related to the primary mercury production in Khaidarkan, development of a complex of measures, by the Resolution of the Government of the Kyrgyz Republic on March 10, 2009 #101-r. an Inter-ministerial Working Group on developing of a Plan of measures on the issues of production of primary mercury and reduction of its impact on the environment in the Kyrgyz Republic, was created. Methodical, organizational and other implementation of activity of an Inter-ministerial Working Group was assigned by the same resolution to the State Agency on Protection of Environment and Forestry of the Kyrgyz Republic (SAPEF or the Agency.)

SAPEF with assistance of UNITAR has attracted national consultants to carry out the Social and Economic Assessment (SEA) of primary mercury production impact on environment, as well as international consultants with assistance of the Swiss Government to carry out the Technical Assessment (TA). Despite certain difficulties, related to obtaining of credible information the studies were conducted between population of Khaidarkan and KhMJSC workers , and preliminary documents were submitted to the working group for consideration, comments, recommendations, and additional or qualifying information. The members of the working group members have made their contribution as recommendations, and most of them were introduced into the mentioned documents. Based on SES and TA, and with the use of other materials, the Preliminary Action Plan was prepared, that is now being submitted for the consideration of the Forum (Bishkek, July 6, 2009) on the production of primary mercury in the Kyrgyz Republic, and it has been approved, along with other developed information documents.

3. Problem and purposes statement

The Khaidarkan mercury mining plant, was transformed into the Khaidarkan Mercury State Joint-Stock Company. It is located in the Aidarken settlement of Batken region, and is an operating enterprise, mining monumental (mercury) and complex (mercury-antimony-fluorite) ores.

Problem:

The KhMJSC is continuing its activity, despite the serious technical and environmental and economic problems, such as:

- Physical and chemical risk of mine waste stored at the mining site
- Elevated mercury concentrations in agricultural soil, river sediments and foodstuff produced in the region
- High level of depreciation of the capital assets and their noncompliance with the modern technical requirements;
- High level of losses;
- - Lack of the qualified technical engineers and workers;
- - Low quality of marketing and production management.

Goals

- - Elimination of hazardous impact of the KhMJSC on the environment
- Elaboration and improvement of the legal base, concerning the activity of the mining enterprises.
- - Social and economic development of Khaidarkan community
- Upgrading, improvement of production or its re-orientation of mercury mining activities at Khaidarkan towards to other less environmentally harmful economic activities
- - Public awareness on the risks related to primary mercury production

A. Environment

1. Information and situation analysis

Currently, Khaidarkan mercury plant is transformed into Khaidarkan Mercury State Joint-Stock Company (KhMSJSC). It is mining monometal (mercury) and complex (mercury-antimony-fluorite) ores, only of Khaidarkan deposit and producing metal mercury, fluorspar concentrate, processing mercury-antimony concentrate, both of its own production, and imported.

For internal republican needs mercury is not used, all the products of Khaidarkan State Joint-Stock Company are exported to different countries. The main buyer of metal mercury is the Chinese Peoples Republic (up to 80 % of production), the countries of the European Union and the USA (20 %). It is possible that some of the buyers acts as intermediaries.

Internal republican mercury reserves are estimated at 50 000 tonne (t) and more. At Khaidarkan deposit, mercury reserves make up to 20 000 t., antimony more than 100 000 t., at Chonkoj mercury it is up to 25 000 t.

Most of the wastes of the processed mercury ores are stockpiled in the vicinity of the production (mine, mill etc.).

The analysis of the publications in the sphere of the studies of impact of mercury and mercury compounds on human's health was conducted irregularly and in various directions, mainly with the emphasis on sanitary and hygienic examining of patients. Anthropogenic impact of the metal mercury production places on population of medical, or ecological and biochemical type were not conducted in the republic. The studies on intake of mercury into human's body with food were also not conducted.

1.1.1. Emissions and wastes

The plant in the days of active operations, annually used to release into the atmosphere about 13.22 t. of metal mercury, 315.9 t. of dust, 295.3 t. of carbon oxide and 45.02 t. of sulfur dioxide, there also were piled big volumes of solid wastes.

Major waste facilities at the Khaidarkan Mercury State Joint-Stock Company (KhMSJSC) comprise slag deposits (waste from mercury ore roasting), tailings deposit (waste from flotation process) and waste from mercury purification. In total there are about 17 million tonnes of mercury rich waste stored in Khaidarkan. Most facilities have only limited or no protection measures at all to prevent dispersion of mercury waste in the environment. Wind and water erosion contribute to destabilization of these deposits and increase the physical risk at the site. This in particular of concern given that the area displays elevated risk for earthquakes and landslides.

Currently about 13.3 million t. of cinder are placed on the dumps near the metallurgical works and settlement on the area of 39 hectares, with mercury content of 200 mg/kg. Thus mercury concentrations in the cinder, according to the estimations, are in a range of 0.001 % to 0.05 %.

In the tailings, the surface of which is 22.8 hectares, 4 million t. of waste is stored. It makes 47 % of tailing rated capacity. According to the tailing analysis executed by UNEP/GRID-Arendal in 2008, mercury content in dry materials make 126 mg/kg.

In addition there are four sludge reserves at the enterprise, where a total of 4 thousand t, of dry sludge is stored.

According to the analyses executed in 2008, within the limits of the present estimation, mercury content in sewage waters make 14 mg/l. In all other water samples, carried out under the study, no considerable mercury concentration was noted.

1.1.2. Air, soil, and water

The researches showed that until 1990, the highest mercury concentration in Khaidarkan settlement, were observed, when there were winds blowing from the east towards the settlement in the direction from the metal works to the settlement. The concentrations sampled in the settlement were in a range of 0.0003-0,0042 mg/m³. Now, according to Kadamzhajsky Sanitary-Epidemiological Department (SED), in the village of Sur, located approximately in 8 km to the West from the factory, no high mercury concentrations were noted. However, in the Khaidarkan settlement the average mercury content in the atmosphere is higher approximately by 3 times, than in Sur, and in some cases it exceeds the corresponding MPC level, established in the Kyrgyz Republic (0,0003 mg/m³).

In the course of the given studies an essential soil pollution was discovered, the level of which exceeds MPC established in the Kyrgyz Republic, in some cases for more, than 10 times.

Water sampling analysis has shown the absence of mercury concentration in the natural water, however it is necessary to note, that the equipment used for the analyses was of low sensitivity. Although water samples from the river Galuyan, did not show mercury

content, there was metal concentration in the bottom sediment, which points the metallurgical plant as a source of mercury in the river.

In tap water of Khaidarkan settlement high concentration of antimony (75 mg/l) were observed. For comparison it is possible to result the specification of the MPC of antimony in the potable water, accepted in Sweden which makes 5 mg/l.

1.1.3. Human's health

According to the Khaidarkansky hospital data, in the graph of the level of morbidity in 2007 there prevailed such diseases as: urino-genital system - 13.5 % (371 incidents); cardiovascular system - 9.9 % (271 incidents); respiratory system - 9 % (248 incidents); gastrointestinal tract - 7.8 % (216 incidents). Among the causes of death a leading place belong to the cardiovascular system and respiratory system (50 % and 22 % accordingly)¹. No obvious impact of the high concentrations on population on the whole was noted.

The changes of the immune status of children were accompanied by an immunodeficiency and an immune regulatory index reduce. Children's morbidity on the territory, where research was conducted, is mainly connected with the diseases of respiratory organs, hematopoietic system, and with infectious diseases.

Main factors of occupational morbidity among workers of the enterprise are dust and the increased concentration of gaseous mercury. At Khaidarkansky plant 120 workers with occupational diseases, including 27 workers suffering from mercury intoxication, were registered in 1990. In the structure of occupational morbidity for the period of 13 years the biggest specific weight is occupied by vibration disease (43 %), bronchitis (39 %), and mercury intoxication - 0 17,8 %².

For the last five years, no cases of acute mercury poisoning among workers of the plant or local residents were registered.

1.2 Field researches

In the course of the field researches, it was established, that most employees of KhMJSC, residents of the Aidarken settlement, and of villages, located in its vicinity, answered in the negative to the question about hazardous impact on the state of their health.

¹ Comments of Sanitary inspector A.Poltavskaya of 3.06.2009

² Comments of Sanitary inspector A.Poltavskaya of 3.06.2009

They have answered, that they do not take any precaution measures on prevention of the harmful impact of mercury. However, residents of the villages, that are located close to the tailings, consider themselves as exposed to harmful impact. In the answers distribution, to the question “If there was harm from KhMP?”, the overwhelming majority of respondents from the all interviewed villages, located in the KhMP impact zone have noted the presence of tailings and dumps, with the exception for those villages that are located at a distance.

Only 50 % of the residents, living in the vicinity of KhMJSC have answered to the semi-open type of question «What does KhMJSC give to you personally?». The overwhelming majority of the respondents answered, that KhMJSC personally to them does not give anything. At the same time, it is necessary to mention, that almost none from the respondents noted such impact factor, as «harm to health.»

1.2.1 Legislation

Organizational and legal bases of prevention and elimination of the hazardous impact of harmful factors on the environment, including chemical substances, on the human’s health and on the human environment, the management principles of the chemicals use, of increase of awareness, of improvement of safe use of chemical substances and accidents prevention are established in more, than 25 Laws of the Kyrgyz Republic.

There is a necessity of making a cadastre of dangerous wastes, conducting inventory, updating of the legislative base, and bringing it in accordance with the international standards and rules. It is necessary to create a database with further adaptation, its unification with all-European database. There are also such problems on as evacuation, liberation of mercury and transportation to big distances³.

1.3. Ecological monitoring

The KhMJSC is required by law to prepare an Ecological Passport, which contains the inventory and agreed limits of Maximum Allowable Emission (MAE) and Maximum Allowable Discharge (MAD), to conduct a constant monitoring of all the territory of the plant, as well as an action plan with environmental protection measures to which the plant is

³ «About Condition of Mercury Problem in Kyrgyzstan». Noruzbaev K.M., Tolongutov B. Kyrgyz Republic, Ministry of Environment and Emergency Situations, Chujsky ecological laboratory.

committed. However, the problem with the MAE and MAD approach is that it does not necessarily address the impacts of discharges and emissions on ambient conditions.

In general, the lack of adequate activity on monitoring, absence of suitable measuring equipment and local capacity in conducting sampling campaigns makes efficient emission control very difficult in KhMJSC.

1.4. Responsibility

According to the Law on environmental protection, residual pollution or damage to the environment caused before 1992 is considered to be the responsibility of the state. Adequately identifying and attributing environmental liabilities, as well as the parties that are responsible for the ecological consequences of past activity is important for the previous owner (the state) and the new private owner. In the unlikely scenario of KhMJSC privatization experts believe that responsibility for environmental legacies, especially land contamination and waste, will most likely be assigned to the local administration and/or any other state institution.

1.5. Gaps analysis

Based on the information collected by the international and national experts and analyzing current ecological situation at KhMJSC it is possible to conclude, that key priorities of activity on decrease in risks and impact levels are the basic sources of pollution revealed during the present estimation:

- Metallurgical production and a sediment bowl sludge;
- Dumps of cinder;
- Tailings deposit

Technical conditions of waste storage facilities are poor and require improvement to obtain safe conditions

Based on analyses conducted over the past years, environmental remediation of critical operational facilities will be required to ensure environmentally responsible and safe conditions in the surroundings of KhMJSC.

Other factors affecting the ecological condition more detailed in the following: Socio-Economic Assessment and the Technical Assessment of environmental issues associated with the production of primary mercury in the Kyrgyz Republic, economic and infrastructure assessment and capacity research to implement environmental restoration measures in place mercury production in the Kyrgyz Republic.

B. Economic aspects of mercury production

2. Information and situation analysis

In order to improve financial results of the KhMP activity, complex ore mining and subsequent fluorspar production will be suspended due to its inefficiency and priority will be given to mercury production by expanding existing shafts and developing new shafts at significant cost. It is suggested that these measures should enable the company to operate for 4 to 5 years more. In addition to mercury production from mined ore, there are plans to increase the use of secondary sources such as waste materials from abroad or available on site. Since energy cost make up a considerable part of expenditures, energy saving measures are given priority. In addition it is hoped that the government will engage in the operations by providing long-term low interest loans and subsidies for geological exploration.

Starting in early 2007, Kyrgyz representatives have established a dialogue with representatives of the city of Vienna, Austria, regarding joint development opportunities. In response to the Kyrgyz request, the Austrian company Alaris AG has developed a Master Plan for South of the Kyrgyz Republic cooperation with the Kyrgyz Ministry of Economic development focusing on Osh, Batken and Jalal-Abad provinces. The Master Plan identifies concrete economic, technical and social infrastructure development opportunities in the region.

In parallel, it was decided to create a public-private-partnership for a joint venture company responsible for developing suitable projects that can be tendered. The Kyrgyz Government has indicated its willingness to make financial contributions to support this project. In November 2008, the Government signed an MoU with the company to pursue cooperation. In Austria the project is coordinated by the Kyrgyz Embassy in Vienna.

2.1.1. Power consumption

Average annual consumption of electricity at the Khaidarkan plant is 46 million Kvt\h. Average annual consumption of natural gas makes 300 thousand of cubic metres. In total cost of input energy consumption makes 25 %. Recent decisions of the government provide increase in the cost of the electric power by 2012 twice as much. Natural gas is delivered by Uzbekistan, the cost, by estimations, makes about 150 US dollars for 1000 m³ (in 2007-2008.)

2.1.2. Transport and communications

One of the main tasks of development of the infrastructure of Batken area is construction of the road “Kyzyl-Kija – Kadamzhaj - Batken – Isfana”, bypassing the territory (enclaves) of the neighboring Uzbekistan. Attraction of foreign investments is required.

Geopolitical features of area, the condition of transport communications, require immediate measures on development of aviation transport in the area. The issue of creation of “Batken” airline is being considered, with further transfer onto the balance of airports “Batken”, “Kyzyl-Kija”, “Isfana” and necessary park of aviation equipment.

Only for reconstruction of airport in Batken and purchase of aircrafts and technological aviation equipment, investments at a rate of 50 million dollars of the USA are necessary.

Currently, priority direction in Batkensky area is development of telecommunication networks and the solution of the issue on transition to the modern types of digital communication.

2.1.3 Taxes and royalties

In 2002 the enterprise has received about 50 thousand US dollars, as net profit (total volume of production made 125 million soms or 541 t of mercury), capital asset was estimated at 3 million US dollars. In 2003 the enterprise was offered for sale for the purpose of privatization with initial bid of 2 million US dollars, under the condition of investment of additional 6 million US dollars within three years after acquisition.

From January till March, 2008 sales of Khaidarkan plant have made 35,6 million soms (65,2 t mercury), that is 5,6 million soms more than for the similar period of the previous year.

The amount of payments, that is considered to be as compensation for negative impact of the activity of the enterprise, depends on scales of exploitation of natural resources and ecological system services. Annual transfers of Khaidarkan to the payments fund make about 300 thousand soms (about 8500 US dollars). Almost three quarters of payments remains in the local budget.

In KhMJSC reports, the level of wages grew by 17-19 % in 2007 in comparison with 2006. In January of 2007 the wages to the employees were paid, as well as taxes and other types of payments for a total sum of 108,2 million soms, including profit tax – 28,6 million soms, payments to the Social fund - 95,4 million soms⁴.

2.1.4. Current state of KhMJSC for 5 months period in 2009

According to the latest data provided by the Ministry of the Industry and Trade of KR from 01.06.2009 production has made 45 million 813 thousand soms that compared to the corresponding period of 2008 is 72 %, including: mercury – 88,6 t, antimony concentrate – 23,4 t. Realized production made 26 million soms.

⁴ Letter of Khaidarkan Mercury JSC of 03.01.2007, to the Prime Minister of KR “About maintaining grace tariffs”

Actual number of the workers is 667 people, against planned number of 900. The average salary is 5,728 soms. Losses have made 7.8 million soms. Accounts receivable are 9 million, bills payable - 59,3 million soms.

The enterprise has suffered losses to the amount of 1.8 million soms from mercury sale this year.

The total volume of the production program of the enterprise planned for 2009, in comparison with 2008, makes 87.8 %.

It was planned for upcoming period to reach monthly output in volume of 25 t of mercury for the amount of 12 million soms. The measures are taken on reduction of the expenses on fuel and energy resources, specific weight of which is more than 50 % in the expenses for mercury production.

2.2. Economic alternatives for Khaidarkan

According to the Ministry, the plant is included into the list of objects for privatization in 2008-10. As the administration also expects inevitable reduction of reserves and of production of primary mercury in the long term, it is necessary to develop a joint approach which would allow to ensure employment and health of the population of the settlement.

Since, for all the interested parties, a gradual reorganization of the plant, is the most appropriate option of cessation of production of mercury and transition of the enterprise to other kind of manufacture, the following kinds of alternative production are being considered:

- Cement production
- Gold mining
- Extraction of bauxites and aluminum production
- Bentonite
- Manufacture of fire-resistant bricks
- Processing of mercury containing waste
- Construction industry
- Tourism
- Food processing industry

- etc.

2.3. Legislation

The legislation of the Kyrgyz Republic, regulating activity of mining branch of industry and issues of environment protection related to that, is rather extensive and complete. In the Strategy of Development of the Country for 2009-2011 it is stated, that bylaw acts – provisions, instructions and orders, concerning activity of mining sector of the Kyrgyz Republic, sometimes interpret the current legislation in two ways, complicating procedures of licensing and activity of the extracting enterprises.

2.4. Field researches

During the field research it is established, that the KhMJSC continues production of mercury and it is facing obvious financial difficulties. Many employees, residents of the settlement have additional small-scale businesses, mostly in trade of the household goods and products. The overwhelming majority of respondents in the villages consider, that the best alternative type of business for Khaidarkan is construction of the plant of processing of agricultural products.

2.5. Responsibility

If conditions for privatization involve major obligations for the private owner to address environmental pollution, it is expected that assets will become highly unattractive. The additional unattractive factor for the investor is enterprise's debt. Therefore a potential private owner will require that the stocks and flows of the pollutants be defined by an audit and agreed with the government. In the discontinuation of mercury production scenario due to economic hardship or other reasons, plant management should take responsibility for the clean-up measures.

2.6. Program documents

The Country Development Strategy 2009-2011 (Kyrgyz Republic President Decree, 03.10.2009) of the Kyrgyz Republic for primarily focuses on the following types of extractive industries: gold mining, construction materials (cement), energy resources (coal, oil, gas) and does not mention mercury production among priorities. The Strategy indicates that there are four industrial mercury reserves: two reserves are not in use (abandoned-dormant mines, see Annex 1 for details), and the remaining two with 16 400 tonnes of metal are used by the

KhMJSC, which is experiencing economic difficulties due to fluctuations of mercury prices and low profitability.

Other state programmes such as the Programme (2002) for industrial development of the Kyrgyz Republic for 2002-2004 until 2010 (Kyrgyz Republic Government Order from 16.05.2002 №309) and the Programme on export development and import substitution of the Kyrgyz Republic for 2007-2010 (Kyrgyz Republic Government Order from 09.02.2007 №43) consider continuation of KhMJSC operation with mercury output at 350 t/y.

2.7. Gaps analysis

A number of problems is connected with specifications of work of KhMJSC:

poor quality of ores and growing prices for energy complicate economic conditions of working out of the deposit;

mining conditions are difficult owing to increasing depth of mining and inflow of water to mines;

morally and physically out-of-date equipment reduces production efficiency and its ecological productivity;

additional problems are connected with remoteness of the enterprise, in particular, long distance to railway system, and the complexity of procedures of crossing the borders.

C. Public health and social and economic life of Khaidarkan community

3. Information and situation analysis

As of 1989 the aggregate number of the population of Khaidarkan settlement, made 11500 people from whom 3500 people are occupied at the mercury plant. From the moment of gaining of independence by the country the quantity of employees of the plant reduced to 1500 people in the middle and the end of 1990th. There were 750 workers in 2008 while the settlement population decreased to 9-10 thousand people (in 2007-2008.) Nevertheless, the plant remains the vital source of the income for local population. The community consisting of 15-20 thousand of the people is closely connected with the plant activity. They live in Aidarken and in nearby villages Eshme, Sur and Bel. The plant provides means of subsistence of this population either by direct employment, or indirectly, for example, providing water for agricultural irrigation. The main type of cultures grown up around the mine, include a potato, carrots and grain.

Batken area provides 3-4 % of Gross national product, 2 % of industrial production and 9 % of agricultural production. The total amount of industrial production in Batken area in 2008 has reached 1,5 billion soms, and agricultural – 7.5 billion soms. The total amount of investments has made 2,2 billion soms, and half of this quantity is connected with the construction of cement plant in Kyzyl-Kija. An average salary in Batken area in 2008 has made 3820 soms⁵, and at Khaidarkansky plant - about 5000 soms.

3.1.1 Population and migration

In 2008 on the territory of Aidarken settlement administration the number of households was 1,341, the population made 10,938 persons, 4,950 of them are men and 5,988 are women (see Appendix 3 of SEA.) Electric power supply is 90 %, gas – 20 %, coal – 50 %, fire wood - 80 % of families. 65 % of inhabitants of Aidarken settlement administration (village council) have access to pure potable water.

The population of 11 villages of Berlik villages administration in 2007 made 1,1824 people, including: working people - 6,119; households - 2,232 (see Appendix 6 of SEA.) The greatest growth of population at able-bodied age for the last five years is marked in the Osh,

⁵ 1 US dollar = 40 Kyrgyz soms (average course in 2008).

Zhalal-Abad and Batken provinces, 9-12 percent (see Appendix 7 of SEA.) In 2007 in territory Aidarken settlement administration there arrived 75 people, 200 people departed.

*Migration structure*⁶

From the date of area formation, migratory outflow has made more than 6.0 thousand people. There is no information on professional migration. Incompleteness of delimitation and demarcation of borders with the neighbouring republics, also influences migration.

	2005		2006		2007		2008	
	Arrived	Left	Arrived	Left	Arrived	Left	Arrived	Left
18-30 years	40	556	45	763	57	824	32	179
31 and older		11		12		18	3	29

3.2 Economic and social development of the Osh and Batken provinces

3.2.1 Linkage with the general strategy of national development

Analysis of GRP of the provinces for 2004-2006 shows that consecutive and systematic realization of the provided measures on escalating of rates of production in the main sectors of economy has allowed to ensure and strengthen positive tendencies in social and economic development of the region. GRP per capita was 8,439 soms and on average republican level it was lower almost by 2.5 times.

The considerable share is in production of food (52.7 %), metallurgical production and production of ready metal products (24.8 %), production of tobacco products (11.5 %) textile industry (3.7 %).

In metallurgical production the industrial output volume is made by production of antimony, mercury and metal products and increases on the average by 4-5 %.

Priorities: Increase in volumes of frontier trade with the adjacent states, creation Free economic zones⁷.

⁶ The Program of Social and Economic Development of Batken province for 2008-2010.

According to the Country Development Strategy (CDS) from 2009 till 2011 in Batken province priority directions are: agriculture, processing industry.

For 74 % of the population of Batken province agriculture is a dominating sector of economy (the share in Gross regional product was 54.7 % in 2004.) The province is the producer of tobacco, the best brands of grapes and fruit, which is processed and exported (wine, a dried apricot, canned fruit, fermented tobacco.) In addition, the area has potential possibilities for development of goat and yak breeding. Involvement into circulation of new lands, out of proceeds of channels construction of Kara-Kyshtak-Boz, Sarkent-Too-Zhajloo, is one of priorities for development of agriculture of the area. The area has considerable capacities in tobacco fermentation, production of grape wines, vegetable and fruit canned food. The increase in production of agricultural production will create preconditions for development of processing industry, creation of new enterprises.

Creation of transport communications is of great importance for the development of economy of the region, including completion of building of a bypass road the Kok-Talaa-Pulgon-Burgondu-Batken, roundabout road Aigul-Tash-Sogment-Charbak, reconstruction of internal roads⁸.

3.2.2 Social protection system of KhMJSC

Expenses of Khaidarkan plant for social protection and personnel health protection make 1.8 million soms a year. Owing to reduction of the number workers at the plant, the capacity of preventive clinic lowered to 50 beds. Annually in the clinic, 500 workers get treatment, that makes about 80 % from the general number of workers.

According to the report on financial and economic activity of KhMJSC for 2007 is 1 million 499 thousand soms were paid as a flat fee benefit.

Preschool and educational institutions of settlements are in immediate proximity to KhMJSC, they consist of 2 kindergartens, 9 comprehensive and 1 incomplete high schools. All construction buildings are of Soviet times, however, maintenance repairs are conducted regularly and their condition is satisfactory. From medical institutions, there is a hospital with

⁷ The program of Social and Economic Development of Batken province for 2008 2010

⁸ Country Development Strategy for 2008 - 2011

medical staff of 242 people, 2 medical points and three drugstores. From objects of cultural-entertaining purposes there is an open Palace of culture, club and 2 libraries.

3.2.3. Researches on interrelation between pollution with mercury and other heavy metals with death rate and morbidity of the population of Khaidarkan community and the region in general

The studies of the impact of mercury and mercury compounds on a human body in the areas of operating mercury productions, by the research organizations of the Ministry of Healthcare of the Kyrgyz Republic, were not conducted regularly. They were done with the main focus on sanitary-and-hygienic inspection. No research was done on the impact of anthropogenic impact of production of metal mercury of the medical, environmental and biochemical nature in the republic. Mercury intake into the human body with food was also not studied⁹.

Among the reasons of death of workers involved in mercury production the first place is occupied by malignant tumor (20.8 % - men and 40.0 % - women); the second – illnesses of cardiovascular system (17.8 %), and women have illnesses of urinary systems (25.7 %). Among the causes of death from malignant tumor (men) the first and second places occupy cancer of digestion organs (69.6 %) and respiratory organs (29.1 %). Women: cancer of digestion organs (57.1 %) and reproductive organs (35.7 %.)

In lost time morbidity of the workers of KhMJSC there prevail respiratory organs (26.5 %), illnesses of musculoskeletal system (14.4 %), illnesses of skin (7.2 %), cardiovascular diseases -16.6 %.¹⁰

According to Khaidarkan hospital, in morbidity structure in 2007 the following diseases prevailed: urinary and reproductive system–13.5 % (371 cases); cardiovascular system – 9.9 % (271 cases); respiratory system – 9 % (248 cases); gastrointestinal tract of 7.8 % (216 cases). Among causes of death the leading part belongs to cardiovascular system and respiratory system (50 % and 22 % accordingly). For the last 5 years no cases of acute or chronic mercury poisoning among workers of the plant or local residents were fixed.

3.2.4. Employment of men and women in agriculture, industry and sphere of services in Khaidarkan area, in Batken and Osh provinces

⁹ «About Condition of Mercury Problem in Kyrgyzstan». Noruzbaev K.M., TolongutovB. Kyrgyz Republic, the Ministry of Environment and Emergency Situations, Chujsky ecological laboratory

¹⁰ Comments of Sanitary inspector A.Poltavskaya of 3.06.2009

It is hardly possible to state that respondents consider KhMJSC the major employer in the region as 90 % of residents could answer the question about the number of employees working at the plant. However for the settlement of Aidarken, KhMJSC is the large employer, directly providing about 700 families with means of subsistence.

Nevertheless, the plant remains the vital source of income for local population. The community numbered to 15,000–20,000 people depends on the plant either by direct employment or indirectly – rendering different type of services to the plant, example: use of agricultural waters which is pumped out from mines, etc.

In 2000 – 2008 a growth of registration of the unemployed (excluding 2002) had been observed. By the end of 2007 officially registered unemployed in the province made 6,597 people, that is by 1.4 percent less than in 2006.

A big share among the unemployed fell on young people at the age from 30 to 40 years old, which in 2006 made 30.8 percent from the total number of the registered unemployed. Men in the number of the unemployed made 66.8 percent every tenth individual among officially registered unemployed is an expert with the higher and medium vocational education.

3.2.5. Working conditions of the personnel at KhMJSC

In general, the legislation of the Kyrgyz Republic, to sufficient extent, provides notification of workers on working conditions, ways of health protection and a quality monitoring in the field of treatment of chemical substances, that completely exclude or reduce to the minimum, the danger of negative impact on health and surrounding. Unfortunately, in an industrial practice not always and not all of the provisions, stipulated in the Kyrgyz legislation are observed¹¹.

In 2007 2 million 874 thousand soms were spent on the measures of labour safety. From this amount 1 million 871 thousand soms were allocated for special diet products; milk - 695 thousand soms. Nomenclature actions are executed for the sum of 915 thousand soms. Special overalls and means of individual protection were purchased for the sum of 307 thousand soms, some of them were made by own effort for the sum of 279 thousand soms.

¹¹ SAPEF at the Government of the Kyrgyz Republic, “National profile, Assessment Development of National Potential for Performance of the Strategic Approach on Management of Chemical Substances in the Kyrgyz Republic”

In 2007 at the enterprise no incidents involving industrial traumatism were registered. 2 cases of occupational disease (vibration) were established.

In 2007 the enterprise paid 1 million. 499 thousand soms as compensation in connection with injuries and occupational diseases, from which 793 thousand, soms paid as flat fee benefit. Such amounts seriously affect the general financial state of the enterprise (see Appendix 2 of SEA)

3.2.6. Incomes of Khaidarkan community and Batken province

Region	Production volumes, in millions of soms	Production structure, in % to the total volume	Index of physical volume of production, in % Compared to the previous year	Number of enterprises	Average annual number of the workers occupied in industry
Kyrgyz Republic	59823.3	100	107.3	1998	272818
Batken province	1356.7	2.3	138.7	54	6079
Dzhalalabad province	7707.2	12.9	105.5	165	19919
Issykkul province	9209.8	15.4	99.7	148	8782
Naryn province	648.2	1.1	106.4	80	3405
Osh province	540.0	0.9	124.7	146	4352
Talas province	424.3	0.7	110.6	28	1502
Chuj province	21963.1	27.3	111.9	758	133365
Bishkek city	1647.8	2.7	111.8	120	9211
Osh city					

Main indicators of industry by regions in 2007

Source: National Statistics Committee¹²

In 2007 the monthly average wages made 2779,4 soms, that in recalculation for US dollars based on official exchange rate established by the National bank of the KR, have made 77.2 US dollars. Wages growth in 2007 in comparison with 2006 made 43.6 percent. Starting from 2002 it was 2.8 times, however it is lower than republican indicator approximately for 400 soms. At the same time the minimal consumer budget made 2,013 soms and has increased in comparison with 2006 by 66 %.

Considerable growth of nominal wages in 2007 was marked in all branches of economy, except for hotels, restaurants, and government management branch, where decrease of level of wages in 2006 compared to the living minimum was by 14.1 percent.

The differentiation grows in wages: workers involved in financial activity (10,579.7 soms), operations with real estate, rent and services to consumers (7,487.7 soms), manufacturing industry (4,523 soms), education (3,341.1 soms) were paid the highest in 2007.

Attraction processes into economy of area of foreign labour became more active.

Serious concern is caused by the level of wages of workers of budgetary sphere and incomes in agricultural branch.

On labour market of the area the tendencies of growth in registered unemployment remain. The number of the registered unemployed from 6,691 people in 2006 has decreased to 6,597 in 2007. Thus, practically there are no vacancies at workplaces¹³.

3.3. Field researches

The social poll conducted by national experts in 2008-2009 also revealed that in older age group, the population of these villages think that they are exposed to the impact of mercury production.

The question to the resident of the villages on incomes in 45,1 % was answered "seasonal", thus more than 50 % of income of a family comes from the relatives working abroad – labour migrants.

11 % of employees of KhMJSC consider working conditions as good, 21 % as bad, 67 % did not wish to answer.

¹² SAPEF at the Government of the Kyrgyz Republic, "National profile, Assessment Development of National Potential for Performance of the Strategic Approach on Management of Chemical Substances in the Kyrgyz Republic"

¹³ The Program of Social and Economic Development of Batken area for 2008 2010

3.4 Gaps analysis

Although KhMJSC is the main employer for inhabitants of Aidarken settlement, its activity can hardly be called prospective. Since the times of collapse of the USSR the level of extraction of metal steadily falls down, as well as profitability of the enterprise, and this negative tendency increases.

- 90 % of the interrogated workers of the plant are not satisfied with their wages, the payment of which is delayed for months;
- Kindergartens and schools are closed for the winter period, in connection with absence of heating. Electricity providing companies regularly cut off electricity. In the winter, it is two times a day. Employees often, are not informed about the state of affairs at the plant and due to the delay in payments, many of the employees search for additional earnings;
- Unsatisfactory condition of the water supply complex, there is no full supply of irrigation waters during the vegetative period;
- Adverse general conditions of functioning of agriculture, first of all unsatisfactory level of development of market infrastructure;
- Limited access of agricultural commodity producers to the markets of financial, material and information resources, of finished goods;
- Financial instability of the branch of industry, caused by instability of the markets of agricultural products, of raw materials and food;
- Low inflow of private investments for the development of the branch;
- Reduction of efficiency of the irrigated lands and of livestock;
- Absence or incomplete processing of agricultural products to end production;
- Expansion of the area of not used arable lands (19597 hectares that makes 26 % of arable land);
- Lack of supply with forage reserve for livestock;
- Shortage and deterioration of agricultural equipment;

Non-observance of agrotechnical norms (crop rotation etc.) because of dissociation of households

Conclusions and recommendations

Activity of KhMJSC is defined by following factors:

- Reduction of the stocks of minerals prepared for working off and deficiency of financial resources for preparation of new operational stocks;
- Deterioration of mining conditions of working off on the bottom horizons of a deposit;
- Growth of additional expenses of manufacture;
- Pressure of the international community aimed at the termination of extraction and use of mercury.

These factors specify in the further decrease in prospects on extraction of primary mercury on KhMJSC.

In this connection now there is an urgent question on expediency of a reshaping of combine on development of new deposits of nonconventional kinds for combine of mineral raw materials.

KhMJSC is labour-abundant the enterprise which is carrying out the big social functions in labour-abundant region and during too time the enterprise economically and technically weak with unstable economy and the reshaping is necessary for making in due time socially and ecologically responsible image.

The first what should be done is to find means for defining the preliminary feasibility study described projects (see Annex) and determining the size of investment.

To assess the cost of remediation activities in the area HRAO considering of the experience of similar works in the Mayлуу-Suu tailings funded by the World Bank.

It is necessary of Donors assistance in developing feasibility studies on environmental risk reduction and remediation of the sites, familiarity with international practice and the exchange of experiences in the elimination of pollution contaminated by heavy metals.

DESIGN OFFERS

To the Plan of action

Concerning manufacture of primary mercury and its influence on environment in the Kirghiz Republic

Marking importance of a problem of mercury as a global environmental problem which it is studied, considered and has obtained the world recognition in Board of governors of the Program of the United Nations on environment (UNEP) and considering, that the next years at the international level measures on restriction of manufacture and consumption of mercury which will seriously limit long-term prospect on mercury extraction will be taken, there is a necessity for working out and realisation of a complex of the measures directed on reduction of risks from mercury pollution, maintenance of ecologically safe alternative

manufacture, remediation and sanitation of territories occupied with industrial wastes, liquidations of the saved up waste representing danger to environment. Remediation

Thereupon, taking into account materials of the previous researches, researches of the international and national experts, a number of economically alternative measures for development of industrial activity KhMJSC is offered.

Offered measures are presented by design offers offered during work on the Plan of action concerning manufacture of primary mercury and its influence on environment in the Kirghiz Republic.

Design offers are allocated in two blocks depending on their priority.

Block # 1

Name of the project	«Development of lower seams of the “Novoye” deposit:
Purpose	Use of the production capacities of KhJSC, transition from processing of monometallic mercury to processing of complex mercurial-antimonial-fluorite ores.
Objective of the project	Development of the lower seams in a part of the Khaidarkan deposit known as ‘Novoye’ deposit that has reserves of complex ore amounting to 3464000 tons.
Explanation of the project	An investment project envisages main activities required to be fulfilled as preparation for commissioning these lower seams of the deposit. If this project is implemented one million tons of complex ore, containing 1461 tons of mercury, 22232 tons of antimony and 141 000 tons of fluorite, should be stripped, explored and prepared for operation.
Expected results	It is assumed that the implementation of the project will result in the volume of the received marketable product of 1137 tons of metallic mercury, 7903 tons of antimony concentrate, and 54482 tons of fluorite concentrate. The sales value of the product will be approximately USD 14.78 million for the mercury, USD 10.7 million for the antimony and USD 14.3 million for fluorite making a total of USD 40.7 million. Number of the personnel to implement the investment project is assessed at 50 people.
Budget of the project	The total amount of the required investments is USD 3.9 million.
Expected duration	10 years.
The initiator of the project	KhJSC.
Address	

Name of the project	Cluster Gold Extracting Plant (GEP)
Purpose	Planning of continuation of the activity and a prospect of development of KhJSC at the expense of development of nearby gold deposits.
Objective of the project	Reshaping of the Dressing Plant of KhMP for gold recovery with capacity of 1 million t. of ore per year.
Explanation of the project	The experts of the State Agency of Geology and Mineral Resources concluded that the development of gold deposits in the Batken Province should be a priority. About 25 large and small-scale gold deposits have been identified in the areas accessible to KhMP. The total potential of gold in medium and small gold deposits in the Batken Province is assessed at 282 tons. Deposits at Altyn Dzilga, Chakush, Duvatash, Gavian are 50-60 km away from the KKhMJSC and their mining should be considered in the first place.
Expected results	The total annual production of gold at the dressing plant could be 6-7 tons. About 300 or more jobs will be created at the plant. Approximately 1400 people would be employed at the mining of deposit, and additional indirect employment would be about 1260 jobs.
Budget of the project	Cost of the GEP construction will be around 40-60 mln USD. Investments into mining of the first-priority deposits will be 76 million USD.
Expected duration	20 years.
Initiator of the project	MITSUI Engineering Company.
Address	

Name of the project	“Production of cement from cinder resulting from mercury manufacture process”
Purpose	Obtaining alinite cement from wastes generated by KhJSC with use of production capacities of KhJSC.
Objective of the project	Creation of the production on preparation of cement from waste of KhMSJSC and additional recovery of mercury from process gases by reshaping of the metallurgical plant.
Explanation of the project	<p>According to the conclusions the technology allows a comprehensive recycling of waste associated with mercury production with high level of mercury recovery and high construction and technical properties of the resulting cement. The strengths of this project are:</p> <ul style="list-style-type: none"> • Availability of qualified staff; • The utilization of waste associated with mercury production will have positive environmental consequences; • Availability of mining, processing and metallurgical equipment it would be preferable to set up an enterprise that is close to the profile of the existing one.
Expected results	<p>It is planned to produce 600 thousand t of cement per year at KhMSJSC. An annual output of marketable mercury of 20 tons would be possible.</p> <p>Number of the number of indirect employees and engineers makes 106 people.</p>
Budget of the project	The estimated total capital expenditure is 29 million USD.
Expected duration	20 years.
Initiator of the project	KhJSC
Address	

Name of the project	Production of the gypsum building plaster
Purpose	Use of rotary metallurgical kilns for plaster production
Objective of the project	Construction of the plant on production of plasterboard, fibre reinforced gypsum panels and пазогребневых плит
Explanation of the project	In radius of 25 km to the north of the KKhMJSC the deposits of first grade gypsum are located, which can be used for a wide range of products. The seam of the pure crystalline gypsum is 2 km long and 30 m thick with a gypsum content of 99% and possible reserves of 1.8 million tons of category P1. The plant which is equipped with rotary kilns can easily manage this type of production. The demand for construction for gypsum building plaster is growing steadily. It is proposed to focus on the production of gypsum panels, gypsum fiber slabs and gypsum partition blocks, for which the demand is growing. This project for KKhMJSC could be easily implemented and should be considered as high priority. Transport costs could be reduced significantly considering availability of the infrastructure and production capacity. It would be necessary to carry out a provisional assessment of the reserves in the deposit and undertake a survey of the works needed to establish the quarry. This would costs about 0.5 mln. USD.
Expected results	The production capacity of this plant is 2 mln m ² of gypsum panels and 30 000 tons of gypsum flour per year. Cost of production is 2.5 million USD a year. The plant employs 80-100 people.
Budget of the project	1,5 million USD.
Expected duration	More than 20 years.
Initiator of the project	
Address	

Name of the project	Bentonite Production
Purpose	Creation of the new workplaces, new production capacities.
Objective of the project	Development of bentonite clay deposits.
Explanation of the project	<p>Three bentonite clay deposits – Kyzyl-Utek, Ak-Turpak and Beshkenskoye – are located in the territory of the Batken Province. The industrial and agricultural use of bentonite is wide and diverse varying from heavy industry to result pellets from iron-ore concentrate up to cosmetics production in the perfumery industry. Bringing bentonite in to the formula of mixed fodders (2 % on weight of mixed fodder) for chickens-broilers reduces the cost price of an item of production, and raises profitability of production of poultry on 7.7-15.6 %.</p> <p>Beshkenskoye deposit during the Soviet times was mined by Tajik enterprises to prepare drilling fluids and hence the deposit is ready for operation and requires minimal costs to prepare for mining. Development of the prospecting works at gold and oil deposits in Batkensky area will increase demand on the drilling fluids.</p> <p>Low grade bentonite can also be used for remediation of mercury containing wastes of the KhMP.</p>
Expected results	An approximate calculation for bentonite clays at production volume of 25 thousand tons a year indicate the cost 1,5 mln USD. About 75 people could be directly employed and 65 people, indirectly employed.
Budget of the project	3 million USD.
Expected duration	20 years.
Initiator of the project	
Address	

Name of the project	Assessment of an actual condition of the environment of territory of the Khaidarkansky and the former mercury productions (Chuvay, Ulu-Too, etc.)
Purpose	Assessment of an actual condition of the objects of environment and estimation of the enterprise impact on recipients.
Objective of the project	<p>1) Gathering of the information on climatic, geological, physical and other characteristics, associated with the environment protection and emergency situations.</p> <p>1) Assessment of the quality of air;</p> <p>2) Assessment of the quality of water;</p> <p>3) Assessment of the quality of soil, ground and bottom sediments;</p> <p>4) Search of technological anomalies;</p> <p>5) Situation analysis, recommendations.</p>
Explanation of the project	There are nine industrial sites of the mercury plant on the Khaidarkansky territory. The analysis of the available information specifies a presence of considerable pollution of objects of the environment, but all researches are very old and were carried out insufficiently full.
Expected results	Use of the modern analytical equipment with a threshold of determination of mercury at level of the MPC will allow to estimate a real situation in the area and to estimate rate of impact on local population of the mercury enterprise and waste.
Budget of the project	250 thousand USD.
Expected duration	1,5 years.
Initiator of the project	«Chujsky ecological laboratory» Ltd.
Address	724411, Kojomberdiev str., Ujnaya promzona, Kara-Balta city, Kyrgyz Republic.

Block # 2

Name of the project	«Construction of a factory for fire-resistant bricks and magnesite powder production»
Purpose	Increase employment of the population, reduce unemployment.
Objective of the project	<ol style="list-style-type: none"> 1. Production of firebricks. 2. Production of magnesite mineral powder as natural magnesian fertilizer. 3. Production of magnesite powder as additives to asphalt-concrete mixtures.
Explanation of the project	<ol style="list-style-type: none"> 1. Requirement of the enterprises in territory of the Kirghiz Republic and Tajikistan in fire-resistant materials. 2. Magnesite is also used as a natural magnesium fertilizer. It is an effective, long-acting fertilizer on acid soils that have a low magnesium content. It possesses high neutralizing property exceeding that of a limestone powder. There is a 20-40% increase in yield resulting from its application. The fertilizer contains soluble MgO of over 20%, and also microelements of cobalt, copper, zinc, manganese, iron, as well as talc as soil ripper. At its usage. 3. Bitumen with the magnisite filler of the Sharansk deposit could enable the production of high-grade asphalt-concrete mixtures. The production of asphalt-concrete is relevant in view of mass media reports about the Kyrgyz government financing the construction of roads in Batken Province, Osh-Kyzylkiya-Batken-Isfana and Koktalaa-Pulgon-Burgandy-Batnek, as well as about allocation of USD 20 million by the Asian Development Bank for reconstruction of a motor road between Tajikistan and Kyrgyz Republic.
Expected results	The project's payback period of 6.5 years employing 86 people. Productivity of 6 thousand tons of fire-resistant products and depending on requirement the production of magnesite powder for production of high-grade asphalt-concrete mixtures and fertilizers.
Budget of the project	The estimated investment amounts make 643000 USD.
Expected duration	20 years.
Initiator of the project	KhJSC
Address	

Name of the project	Remediation sludge sedimentation pond and sediment bowls with high concentration of mercury containing wastes
Purpose	Reduction of distribution of mercury into the environment
Objective of the project	Creation of a mobile team with load-haul-dump facilities for a planed disposal of all mercury containing wastes.
Explanation of the project	
Expected results	Implementation of the measures on remediation will provide benefit for both health and well-being of the population, and the environment at the expense of reduction of receiving of harmful substances in the air and dumping in the water environment, and at the expense of safety of land use, creation of the temporary workplaces and getting new knowledge and experience.
Budget of the project	<p>The volume of capital investments on purchase of mine transport equipment will make 400 thousand USD (dump-trucks - 2 units, digger – 1 unit, loader – 1 unit, bulldozers – 2 units, motor grader – 1 unit.)</p> <p>In total for remediation of sludge of metallurgical plant of KKhMJSC 1,6 million USD required. This sum is minimal and does not include all aspects of the remediation.</p>
Expected duration	
Initiator of the project	
Address	