

## Chapter 4. Promotion Plan for Mining Industry

The basic position for the embodiment of the policy of promotion on the mining industry is a synthetic, short-medium term view and connected with the economy based on the understanding of the actual situation of the mining industry.

- **Adjustment role between the government and private sector.**
- **Restoration and reformation of the basement of the mining industry for the settlement of the cause of stagnation of the mining industry.**
- **Adoption of the free economy and reconstruction of the mining industry**
- **Contribution to the economy.**
- **Method of promotion of the mining industry by using the characteristics of its mineral resources.**

The promotion for the Georgia mining industry is to concrete measures, which should be realized for the intermediate and long term linking to the development of the mining industry in the future and reconstruction for escaping the recent stagnation. The realization of measures for the promotion by the government on its own without aid is not easy in the government's financial condition and recent economic situation in Georgia. It is indispensable to become a sound economy with the function of free economic principles. The reforms to increase tax revenue by reviewing the law system and attempting to decrease the tax rate with a time limit on such taxes as VAT, social tax, etc., severe management of tax levy, relax tax system, and simplify procedure of tax to reduce illegal business transactions in the economy are indispensable.

On the other hand, the promotion of investment including foreign capital should be done by carrying out arrangement of the investment environment such as stability of politics and security, and reinforcement of banks, etc.

To promote investment and to implement reforms like this will bring an effect of the realization of the promotion of measures of the mining industry and function as a free economic system. Support from international organizations, USA, Germany, Japan is important for realization of finance, introduction of technology, and knowledge of the EU and USA.

- **Improve economic condition**
  - **arrangement of investment environment, reduction of underground economy**
- **Mining policy • reform of organization, revision of mining code**
  - **Technical cooperation**
- **Restructure mine**

- Technical cooperation, grant, finance loan
- Model mine construction
  - Technical cooperation, grant, finance loan
- Survey of actual environmental impact
  - Technical cooperation, finance loan
- Mining Fund
  - Finance loan

## **1. Basic Policy for Promotion of Mining Industry**

### **1-1 Mining Industry Position for Economic Development**

Copper, gold and manganese of the non-ferrous mining industry in Georgia's mining industry will become the main pillar for production from the viewpoint of mineral reserves, basement of production, acquiring foreign currency and development of local society. Productivity of the Madneuli mine is recovering to the level before independence. However other mines are in suspension or near suspension. The recovery of production by reconstruction of existing mines and effective use of underground resources including the above mentioned metals is linked to over 10% of GDP and has the potential to become like an engine for economic development and improvement of the international balance of payments. Also the mining industry is close to the local society and a strong industry linked to the economy of the local society, promotion of employment and arrangement of the infrastructure. The mining industry has an important role in the development of the local society.

- Mining industry becomes like an engine for the development of the economy
- To recover production to the level before independence and make efficient use of mineral resources are indispensable.
- The mining industry is important for the development of local society.
- Training of human resources to free economy and internationalization are needed.

### **1-2 Basic Policy**

The policy for the promotion of the mining industry is based on the position of the mining industry for development of the economy.

- The mining industry make to link with the development of the Georgia economy, development of the local society and promotion of employment.
- The underground mineral resources possessed are effectively used by having competition in a free market economy toward acquiring foreign currency. International products of copper, gold and manganese are key metals and

priority targets.

- The arrangement • reconstruction of existing mines and development of small-medium scale gold and copper mines is a priority subject. The arrangement of the basement of the mining industry attempts to achieve the above matter in an early stage.
- The environment management system is planned to be constructed for the activity of the mining industry based on environmental protection.

### 1-3 Guideline for Production

To set up a guideline of production and evaluation of the achievement of the guideline and improvement of policy are important for the promotion and development of the mining industry. The guideline should be realistic. The guideline is linked with mining policy,, industry policy and budget for the promotion of the mining industry. The guideline in the study stage based on the record of the mining industry, potential and reserves is as follows.

- The mining industry has a 10% share of the GDP after 15 years.
- Production goals of gold- 10 tons per year, copper- 50,000 tons per year, manganese (concentrate)- 1.5 million tons per year

## 2. Master Plan of Mining Promotion

Master plan has 15-year term based on basic policy and production guidelines and is set up in three stages with each stage being a 5-year term. In the master plan, the promotion countermeasure (action program) is set up for the implementation of the plan.

Master Plan (basic plan)		
1 <sup>st</sup> Stage	2 <sup>nd</sup> Stage	3rd Stage
0—5 years	5—10 years	10—15 years
Reconstruction and arrangement	Construction of basement for development	Independence and growth

### 2-1 Master Plan (Basic Plan)

The mining basement area and mining production area work together effectively by expanding concretely each stage such as arrangement of recent condition, construction of basement and development for three stages (Table 4.1).

**Table 4.1 Concept of Long-term Mining Industry Promotion Plan (Master Plan)**

Year	0	5	10	15
Stage	Term of Reconstruction and Arrangement	Term of Construction of Basement	Term of Independence and Growth	
Aid	Technical Cooperation, Overseas Development Assistance (ODA) loan		Repayment of loans	
Policy, System	Drafting, establishment, execution	Establishment of deliberative council, system perfection	Stabilization of execution	
Circumstance	Improvement of law on foreign investments and procedures	Promotion of foreign capital investment, creation of domestic capital	Acceleration of domestic capital	
Financial market	Stock, t-bills, money market trust	Stability of market, construction of base of trust	Expansion of finance from market	
Tax system	Review of tax rate, kind of tax, method of tax collection	Simplify procedure of tax, increase tax revenues	Stability of tax revenue	
	Relaxation to mining industry (special privileges)	Improve tax system		
Mining code	Revision	Resolution of problems by implementation		
Government organizations	Restructure of mining organizations, comprehensive arrangement of research sector	Resolution of problems by implementation		
Infrastructure	Arrangement of framework by aid organizations, WB, ERBD and Japan, etc.	Arrangement of local infrastructure	Arrangement of infrastructure of mining industry	
Education	Arrangement for adaptation to free market economy (universities)	Install facilities of mining industry (training center)	Balance with condition of development in mining industry	
Exploration	ODA exploration, exploration lead by foreign capital	Promotion of exploration by domestic investment (with subsidy)	Promotion of exploration by perfect privatization	
		J/V with foreign capital subsidy	Survey and prospecting by government organization	
Mining industry information	Implementation of disclosure, construction of basement	Break language barrier, exchange with the world	Promotion of exchange with the world	
Mine	Reconstruction of existing mines, construct model mine	Secure profit, develop by finance from mining fund, operation of model mine	Promotion of development, privatization of model mine	
Mining industry environment	Survey of pollution, monitoring system	Strengthen management system, network system		
Smelter, manufacturing	Reconstruct manganese plant	Study of smelting plants: Au, Cu, Zn	Refining plant F/S, raise various industries related to mining industry (transportation, gunpowder)	
Finance	Prepare and establish mining fund,	Operation management of fund	Abolish fund	
Production guideline for study	Au 3t, Cu 20,000 t, Mn conc. 500,000 t	Au 5t, Cu 30,000 t, Mn 1,000,000 t	Au 10 t, Cu 50,000 t, Mn 1,500,000 t	

First stage: term of reconstruction • arrangement (0-5 years)

- **Arrangement, rationalization and privatization of mines**
- **Reform of organizations of the mining industry (unified, etc.)**
- **Establishment of mining fund**
- **Establishment of mining policy**
- **Feasibility study of model mine**

a. Second stage: term of construction of development basement (5-10 years), forming capital

- **Making a market**
- **Implementation of measures for improvement of productivity**
- **Construct model mine**
- **Introduction of foreign capital and formation of domestic capital**
- **Promotion of exploration and development**

b. Third stage: term of independence • growth (10-15 years), using capital

- **Revolving of mining fund**
- **Privatization of model mine**
- **Establish new mining policy that is conformed to this term of independence**
- **Feasibility study of smelting business**
- **Expansion of product and market**

## **2.2 View for Measures of Promotion**

The view for measures of promotion (action program) for realizing master plan basically is needed to implemented by the Georgia government and mining organizations and evaluation of the condition of the implementation process. However, especially for two terms of the reconstruction and arrangement of the first stage, the measures needed like money, technology and knowledge are indispensable with the aid and cooperation from international organizations and some countries.

An action program is needed to concrete and select suitable programs based on the advance of the master plan at each term (each stage) (Fig. 4.1).

- **For realizing the programs on the term of reconstruction and arrangement of the first stage, leadership of the government and aid from international organizations, etc. are indispensable. Construction of functioning free economic system.**
- **In order to realize the program on the term of reconstruction and development of the basement of the second stage, assistance from the government for domestic**

capital is also needed. The mining industry needs operating function in a free economic system.

- The program on the term of independence and growth of the third stage is linked mainly to the realization of the development of an independent mining industry with domestic capital.

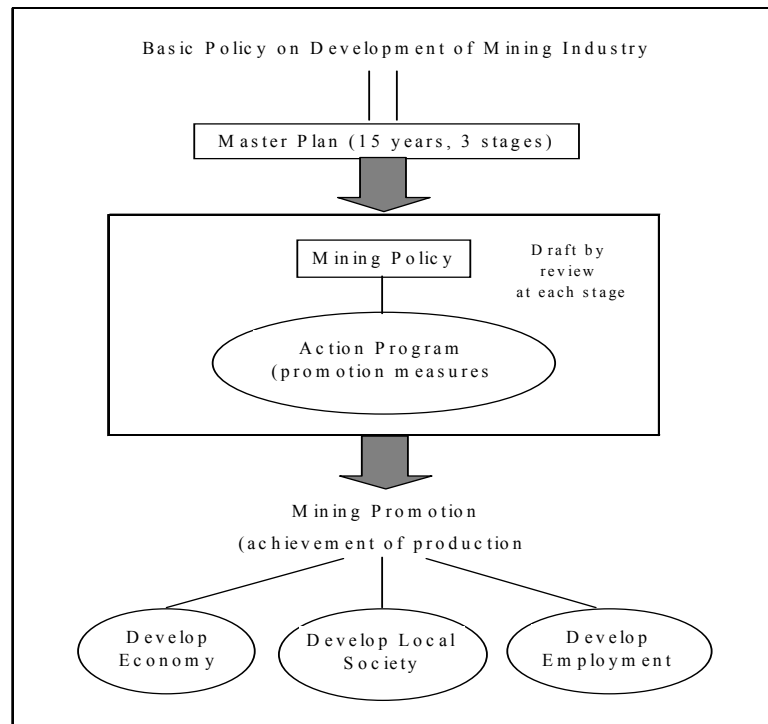


Fig. 4.1 Position of Action Program on Promotion of Mining Industry

### 3. Promotion Measures of the Basement Field in the Mining Industry

#### 3-1 Mining Policy

To establish mining policy and implement administration of the mining industry along with policy is needed on the mining industry to achieve its role as an engine for the development of the economy by the implementation of the promotion measures of the mining industry in the condition that the investment environment is still not provided and the financial market is undeveloped. The mining policy in the first stage, which is proposed now, is as follows.

- Promotion of privatization and formation of domestic capital
  - Supporting measures for money and technology to the activity with independence for the privatized mining industry company (mine, exploration company, smelting company, etc.) (loan system from mining fund, introduction of technical cooperation).

- **Supporting measures for the introduction of a subsidy system with to mining industry companies for the promotion of raising domestic capital and financing from the financial market and arrangement\*improvement of financial market (limited subsidy system from the mining fund, entrustment of government work to private companies, etc.).**
- b. **Improvement of tax system for reconstruction of mining industry**
- **Loosening measures of the present tax system for the promotion of the activity of private companies (reduce the kinds of taxation, decrease tax rate and simplify the procedure for tax declaration).**
  - **Copper, gold and manganese, which are directly linked to obtain foreign currency, are given priority as strategic minerals. The measures for reconstruction of companies to production companies by tax privileges with a limited effective period (but flexible management of tax rate corresponding to the metal price), loan of the reconstruction fund, etc. (a partial amendment of the mining code and tax code, loan from mining fund, special privilege for depreciation with limited term).**
- c. **Promotion of exploration and development**
- **Measures on the arrangement of activity conditions for exploration and development by private companies for the effective use of mineral resources possessed (promotion system of exploration from mining fund, improvement of mining code and regulations related to mining code, lease system of exploration equipment, deduction of corporate tax for investor who buys stock of exploration-development company, etc.).**
  - **A model mine is constructed for making it possible for mine management in a free economy on small-medium scale deposits, which are the majority of deposits in Georgia. Measure for establishment of a mining business by the introduction of technology, system and management method, etc. (establishment of a model mine agency with future operation by the private sector, etc.)**
- d. **Arrangement of conditions for foreign capital introduction**
- **Measure for foreign capital introduction for increasing the entrance opportunity by raising the interest in mineral resources of Georgia through information disclosure and holding investment seminars, etc. (construction of web site and database, unification of information management sector, international exchange, holding investment seminars, etc.).**

- **Promotion measures for foreign capital introduction by simplification of the investment procedure, investment privilege with a limited effective period and scale of investment, and amendment with consistency of the investment law, regulations related to the investment law and mining code (special privilege for foreign capital, measure for conforming to international accounting standards of mining industry companies, etc.).**
  - **Disclosure of financial report of company by web site for having transparency of company.**
- e. Countermeasure of environment to mining industry activity and establishment of management system
- **Environment administration based on grasping the actual situation of the environmental pollution by past mining activity (introduction of technical cooperation program, educational activity for environmental survey company, etc.).**
  - **Installation of equipment for environmental countermeasures and management for mining industry company in the present and future mining industry activity. Instruction and support to implement environmental management, realistic implementation of administration of environmental management (introduction of monitoring equipment, subsidy of instrumentation for environmental countermeasures from the mining fund, spread of environmental technology, etc.).**

### **3.2 Organization System**

The present government mining industry organizations such as mine management, resources management, management for exploration and development and environmental management, etc. belong to different ministries and the State Department. Therefore the functions for the activity of the mining industry are dispersed. The organization for drafting up the plan on mining policy is the Ministry of Environmental protection and Natural Resources but it still does not show its functions. One of the reasons for the stagnation of the present mining industry activity is inefficient mining industry administration with dispersed organizations.

#### **a. Role of mining industry organizations**

Government mining industry organizations have a role for the achievement of production targets by attempting to balance between the environment and activation of the mining industry by promotion of the mining industry. The roles of government organizations



and private companies should be clear in the promotion of privatization.

- The government mining organizations have a role for the implementation of promotion measures, environment arrangement and realization of policy, which a mining industry company can have sound activity, for the development of the mining industry.
- The mining industry company carries out the independent activity of the mining business such as survey, exploration, development and production, etc. and carries the main role for the development of the mining industry. The association of the mining industry (mining associations, NGO) indirectly supports private sector activities.
- Research organizations related to the mining industry should be reorganized on a suitable scale and have a role as the center of research and development of the mining industry receiving orders from government mining industry organizations and mining companies.
- Educational organizations such as universities, etc. should be nurtured for manpower requirements based on the needs of the government mining industry organizations and mining companies. Especially, human resource training for adaptation to the international world is indispensable.

b. Draft of organization system

The organization system should be organized functionally and efficiently with the unification and reorganization of the presently dispersed mining industry organizations (Tables 4.2, 4.3).

- The organization is reorganized at the level of the ministry or agency or State Department, which is composed of sector for drafting policy, issuing the license, license management, environmental management, survey of geology, etc.
- The sector for drafting policy is to draft a mining policy and implement it based on the Master Plan and management of policy. Monitoring the condition of the mining activity is carried out and promoted for investment.
- The sector that issues and manages the licenses is mainly to issue and register the licenses of exploration and mining, and manage the license holder.
- The sector of environmental management is an environment administration organization for approvals on the environment related to the mining industry and carrying out monitoring and evaluating the environment impact from mining activity.
- The sector of geological survey is to carry out and make a plan and settle on the survey of environment geology, mineral economics, local geology, and mineral

geology, etc., and compile data of the survey, environment evaluation and evaluation of mineral resources, etc.

**Table 4.2 Role of Government Mining Industry Organizations and Mining Industry Companies**

Government Mining Industry Organizations	Private Sector (mining industry company)	Mining Industry Association
<ul style="list-style-type: none"> <li>• Establish policy</li> <li>• Make development plan of mining industry</li> <li>• Promotion plan of mining industry and implementation</li> <li>• Make budget for mining industry management</li> <li>• Nurture of mining industry company, instruction</li> <li>• Instruction of mine security and protection of environment, supervise</li> <li>• Improve law and regulations, draft</li> <li>• Management of data • documents of mineral resources, disclosure of information</li> <li>• Collect data information on domestic and foreign mining industry, statistics, analysis</li> <li>• Invite foreign capital</li> <li>• Plan and operation of related research and technology</li> <li>• Plan and operation of regional survey</li> </ul>	<ul style="list-style-type: none"> <li>• Exploration, Development</li> <li>• F/S, engineering, development, evaluation of environmental impact</li> <li>• Implementation of work from government order</li> <li>• Acquire approval of license</li> <li>• Operation of mine</li> <li>• Management of security and countermeasure on security</li> <li>• Countermeasure and management of environment</li> <li>• Introduction of new technology</li> <li>• Various reports to organizations of management and supervision</li> <li>• Technical development</li> </ul>	<ul style="list-style-type: none"> <li>• Mining policy proposal</li> <li>• Unification of privatization of mining industry company</li> <li>• Adjustment between government organizations and private mining industry companies</li> <li>• Introduction to foreign company by web site about mining and company activity</li> <li>• Holding of mining seminar, valuable training courses</li> <li>• International exchange</li> <li>• Introduction of mining industry information of a foreign country</li> <li>• Summary and analysis of data on condition of company activity</li> </ul>

**Table 4.3 Unified Organization Related to the Mining Industry (rough draft)**

Ministry Level	Department/Division Level	Role
Organization Reformed	Mining Department	Make policy & regulations, management policy Promote investment, monitor production
	Mining Cadaster Office	Cadaster license & management, issue license
	Introduction of technology, safety	Development permit, national security & protection
	Mining information service	Database of mineral resources, information service
	Environmental management	Environment permit, monitor
	Geological survey	Applied environmental geology, economic geology, regional geology, environmental geology, and water resources

- Each sector is at the department level. The organization is mainly for administration work. The practical work related to mining activity directly is principally ordered to private sector. The organization should be small.
- Jointly shared information for each sector should be promoted by the introduction of IT.

- On the term of the construction of the development basement of the second stage, the administration of the mining industry attempts the improvement by the implementation of a deliberate council of mining policy composed of government organizations, private companies and advisor from a foreign organization, etc.

### 3-3 Law and Tax System

Mineral resource development is needed for the long term (5-10 years) and much investment. Also collecting investment capital is needed in the long term. Much money is needed for the reconstruction of operating mines. Therefore the payment for the reconstruction money with heavy tax is a heavy burden for the reconstruction and makes difficulty for mine management. The will to develop is decreasing by the high risk of investment, complication of obtaining a license, permission and approval, complex procedure for investment in the present law and tax system. The improvement in the law and tax system is needed to link the promotion of the mining industry. Improvement of the mining law is desired to be implemented by international organizations (for example, the EU, etc.). This is the first subject of the promotion measures of the mining industry, which should be realized. Improvement of the tax system is needed to be concrete. The present problems and improvement points by the establishment of an organizations that traverses over many government organizations like the commission of tax system in the Georgia government.

#### a. Points of improvement in the law • regulations

- The maximum area limit that can be acquired and set up the minimum area for acquiring license in the mining law, permission of the transfer of a license, acquiring a license by a priority right based on the time of application submission, simplify the license procedure.
- The approval system of the ore reserve has become a factor for stagnation of the mining industry in a free market economy since it requires a long period of time. Ore reserves for a development target should be a report from the investor of the development. The investor should be the responsible judge of the reserves.
- Simplification of the procedure for various approvals and permits and shorten the term of the examination of these matters.
- Reduction of the items of management and supervision by the government. Improvement of regulations, security and technology in accordance with the advance of technology.
- A 5-year special privilege for the mining industry, which should be recognized as a strategic industry, in investment law (reduce tax). However, flexible management

is indispensable based on the metal price. Improvement in the investment regulations in harmony with the investment law and simplification for the procedure of investment. The 5-year special privilege is for foreign investment (amount of investment over US\$50 million).

- Special privilege of depreciation such as shorter depreciation period, etc. for machinery and equipment.
- b. Taxation (concrete example, but needs to examine adequacy)
- Five-year reduction measure of tax on business for copper, manganese and gold in the mining industry (application of the same privilege for US\$50 million of foreign investment, however, it is better to manage with consideration of the metal prices)
    - Exemption of VAT
    - Usage of natural resources is 2% of revenue on metals that is not related to the kind of metal (source of money for mining fund)
    - Exemption of social tax 27% (part of wage)
    - Exemption of enterprise activity tax (local tax)
    - Customs for import/export goods that are indispensable for mining activity
    - Corporate tax is reduced to 10% (profit)
  - Five-year term reduction measure of tax on the kind of metals except the above mentioned metals (application for under US\$50 million of foreign investment)
    - VAT 5%
    - Usage of natural resource tax 2% of revenue on metals that is not related to the kind of metal (source of money for mining fund)
    - Exemption of social tax (exemption of 17%, part of wage)
  - Environmental tax related to the mining industry is 0.5% of the revenue as a special privilege with a 5-year term on reconstruction • arrangement term of the first stage in the mining industry (source of money for the mining fund)
  - Deduction measure of income tax for the investor who buys stock of an exploration development company.
  - Deduction measure of tax for exploration activity (until the term of construction of development basement).
    - Income tax deduction of 60% corresponded to the amount of exploration investment.
    - Exemption of excise taxes and VAT for exploration machines, parts and equipment.
    - Exemption of excise taxes and VAT for exploration machines, parts and equipment, which foreign company brings for exploration activity.

### 3-4 Environmental Management

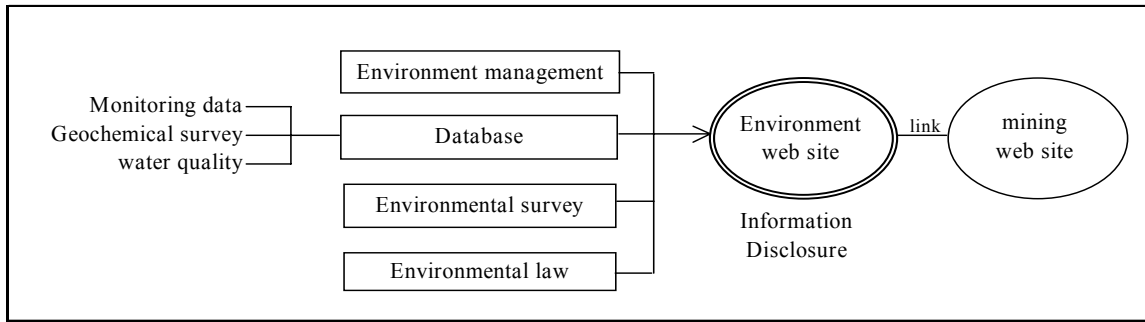
Although laws and regulations related to the environment are arranged now, the management system of the administration and mining industry company is not arranged in actual conditions. The environmental countermeasure from mining activity before independence was insufficient. After independence, there has been no environmental countermeasure administration because of a lack of money. It is in a condition like it was left alone. Instrumentation of monitoring equipment for environmental management on facilities of the production activity is needed on reconstruction and arrangement term of the first stage. The analysis on the degree of pollution, area of pollution and source of pollution needs to be determined by carrying out a survey of the actual conditions of environmental pollution on the Madneuli, Chiatura and Uravi mines. Arrangement of the environment management system needs technology and finance. It is desired to realize it by making requests to international organizations (Chapter 5-4 package program).

- a. Analysis of actual condition of environmental pollution
  - Environmental pollution survey of actual conditions around the Madneuli mine (introduction of technical cooperation program from Japan, etc.) for analysis of the discharge of wastewater containing metals from superannuated facilities of wastewater by the production activity at the Madneuli mine, lead soil pollution by using explosives containing lead, and the spreading of pollution by the dissolution of metals into the soil from ore stockpiles. This is a model survey for the future environmental pollution survey (Table 4.4). Georgia side needs to carry out the pollution survey for other mines by acquiring techniques for this model survey. It is hoped that the survey results will be disclosed on an environment web site.
  - Regional survey of arsenic pollution from Uravi mine (introduction of technical cooperation program from international organization, etc.) for solution and analysis on the pollution area, degree of pollution, and health damage of the surrounding inhabitants. Cooperation from international organizations is indispensable because the pollution is said to be spreading to the Black Sea.
  - The activity condition survey for the flowing out of the tailings from the broken tailings pipe at Chiatura mine to the river. (Instruction of technology from international organizations based on survey by themselves.)
- b. Implementation of environmental monitoring equipment and facilities of environmental countermeasures

**Table 4.4 Environmental Pollution Survey**

Outline of Environmental Pollution Survey Surrounding the Madneuli Mine (model project)	
1. Target of Survey	<ul style="list-style-type: none"><li>• Bolinisi area surrounding the Madneuli mine</li><li>• Surrounding rivers, underground water, soil</li><li>• Surrounding tailings dam of Madneuli mine, ore and waste piles</li></ul>
2. Purpose	<ul style="list-style-type: none"><li>• Analysis of degree of heavy metal pollution, polluted area and pollution mechanism.</li><li>• This model project is for an environmental survey by transferring the acquired technology to the Georgian side through the pollution survey and analysis of the mechanism.</li><li>• Countermeasure will be drafted for the pollution area.</li></ul>
3. Content of Survey	<ul style="list-style-type: none"><li>• Hydrogeology</li><li>• Geochemical survey (general, detailed)</li><li>• Underground water analysis</li><li>• Analysis of pollution area, analysis of mechanism</li><li>• Draft countermeasures</li></ul>
4. Survey term	<ul style="list-style-type: none"><li>• Two years</li></ul>

- Implementation of monitoring equipment for production facilities and base of regional monitoring (loan from international organization, etc. or mining fund)
- Improvement of treatment facilities of wastewater discharge at the Madneuli mine, repair of the pipeline connecting the processing plant to the tailings dam and implementation of treatment facilities of wastewater, etc. are needed (mining fund, etc.).
- Management of monitoring data and construct database and obtaining agreement of a nation based on information disclosure of monitoring data by a web site, etc. by the sector of environmental management (introduction of technical program from international organizations, etc. or mining fund (Fig. 4.2).



**Fig. 4.2 Environment Web Site**

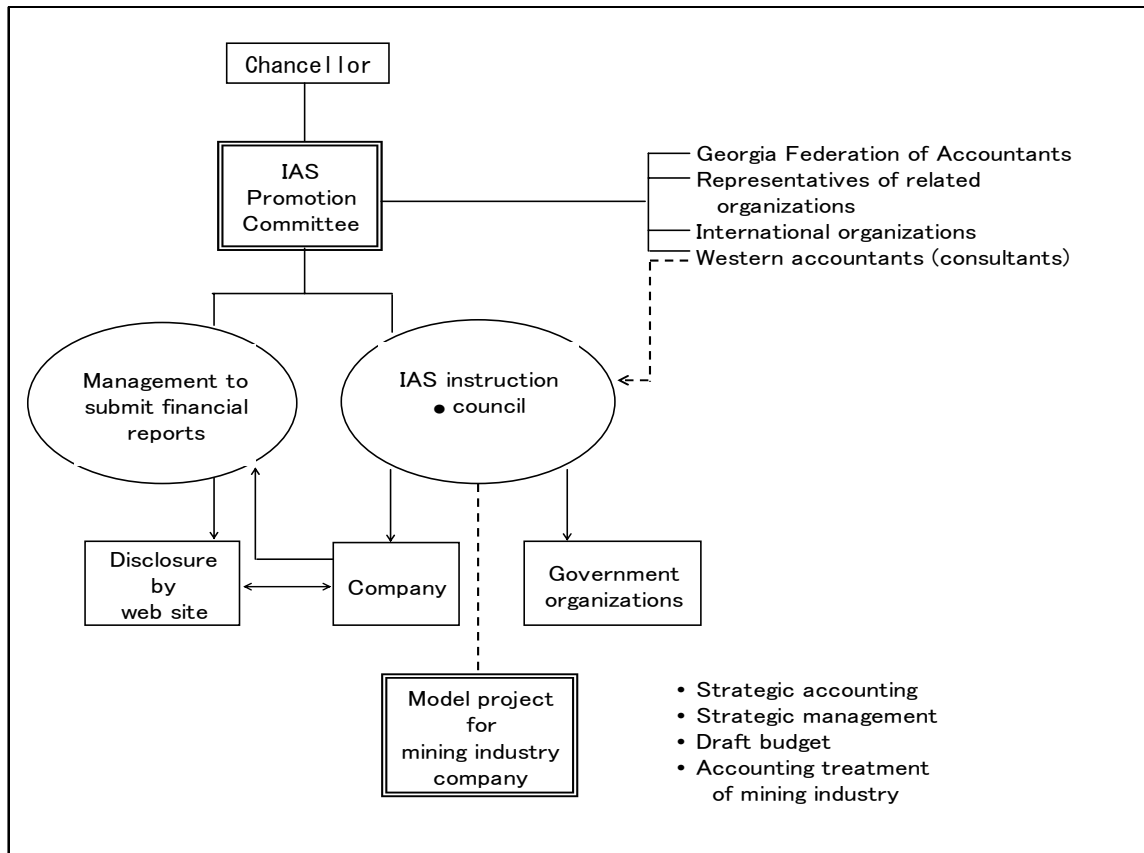
### 3-5 Accounting system

Although international accounting standards have been introduced, its adoption rate is low in the mining industry companies. Fixing international accounting standards, which have a global standard with transparency for the preparation of a joint venture with foreign capital and finance from the stock market, etc. should be realized in the early term. (Individual instruction of international accounting standards to the mining industry companies by European and U.S. consultants from the support of international organizations). Drafting budget, management strategy and improvement of management based on international accounting standards is insufficient. It is needed to fix it and expand it for using in these areas.

#### a. Establishment of promotion committee of international accounting standards

Financial reports based on international accounting standards (IAS) should be disclosed for fixing and using IAS in the reconstruction term and arrangement of first stage for the introduction of foreign capital and sound company management. Measure for disclosure is to be established by the IAS promotion committee (limited term, making sure of its dissolution in the second stage) (Fig. 4.3). Obligation for submitting financial reports from a stock company and system of penalties for violators are needed. Financial reports should be disclosed. Also, IAS promotion committee has a role of instruction of IAS spreading (government organization, company).

- Obligation of submitting financial reports of companies.
- Disclosure of financial reports of stock companies by a web site.
- The sector of instruction and counsel for IAS is installed in the committee.



**Fig. 4.3 Model of Improvement of Accounting System**

b. Improvement measure of management for mining industry company

- Model project (selection of model company among mining industry companies) for management improvement by fixing and using IAS.
- Instruction of European or American consultant (disclosure of content of instruction by web site, request to international organization for the introduction of a consultant).
- Understanding of special conditions (exploration, asset evaluation, depreciation, etc.) of accounting in the mining industry and action.

### 3-6 Privatization

Privatization of the mining industry companies to make stock companies has been carried out until the stage for making a stock company (stock was partially sold to the private sector). Privatization based on domestic capital is a future subject. Buying stock by domestic capital is difficult in the recent condition because of a lack of money throughout Georgia and raising domestic investors. In addition, investment in state mining companies



with privatization is a high risk for foreign capital because there are many existing subjects for reconstruction. It is desirable to finance a government fund for the reconstruction of mining industry companies in the near future. However, priority given to the reconstruction of mine and mining fund, etc. because of the national budget shortage should be studied. On the other hand, improvement of suitable tender conditions with obtaining the consensus of the international community and raising domestic capital and improvement of the state financial condition should be realized.

a. Implementation method of tender

- Review of asset (including ore reserve) by European or American standards. Exclusion of evaluation of superannuated machinery and facilities.
- Debt amount should be reduced from the evaluation value of asset or disposal of the debt before the tender.
- Until the contract signing after the tender, the responsibility of the existing pollution is the responsibility of the government and national company. (However, express clearly the content of the concrete responsibility based on the actual condition found in the environmental pollution survey.)
- The facilities of welfare are out of the scope of the tender. The continuation of employment is limited for a specified term (step by step).
- Either environmental facilities and equipment is completely furnished or the cost for buying the facilities and equipment to make it complete is deducted in the evaluation's asset amount (responsibility of completely furnishing the equipment and facilities is the tender winning company).
- Tax incentive privilege (VAT, income tax, excise tax, etc. but with a limited term).
- Disclosure of financial report by IAS
- Reduction of environmental tax corresponding to the investment needed to be completely furnished for the treatment of environmental pollution in the period of being a state mining industry company and environment investment (survey and countermeasure, etc.).

b. Improvement Measures for Financial Condition

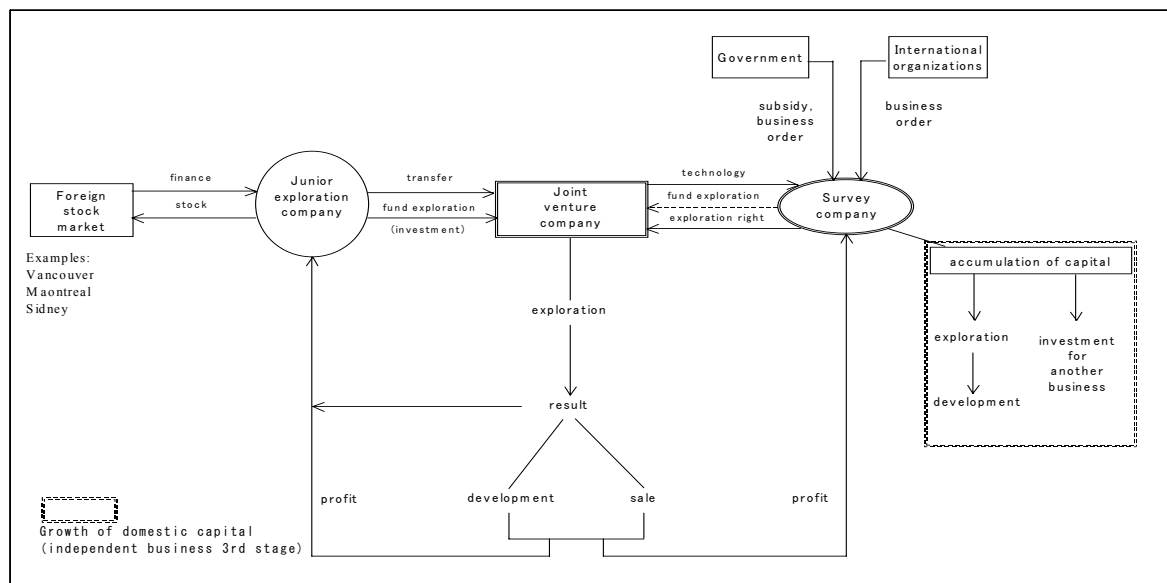
- Improvement by the above IAS model project. Improve the balance sheet and content of financial reports by IAS.
- Terminate loan with trader of concentrate of the Madneuli Mine (2003).
- Secure market (in following section on market survey).
- Tax incentive (above mentioned) and long-term rescheduling of repayment of debt to government (however, it is needed to make a plan for the long-term repayment).

- Make a plan for 5 years management (it needs to have cooperation from expert of international organization, etc.)

c. Measure for Raising Domestic Capital

Complete dependence on foreign capital always is not effective for accumulating domestic capital because the profits are taken away to a foreign country, although it is linked to the securing of employment, improvement of productivity and acquiring technology, etc. Accumulation of domestic capital links to the investment of a business and brings the formation and growth of the financial market, raising industry and strengthening the economic basement. In the future, it may bring the possibility to construct a smelting plant or develop a mine. It is indispensable to create work by making a request of a project to international organizations (Chapter 5-4 package program).

- Order of geological survey, mineral resource survey, environmental survey and construction of a database to a mining industry company from the government and project of international organization.
- Exploration by joint venture with a junior exploration company of Canada, Australia or US (Fig. 4.4). A dispatch of an inspection group will grasp the actual condition of junior exploration companies.
- Financial support by mining fund (mentioned before) or another method such as development financial loan corporation, etc.
- Financing from stock market



**Fig.4.4 Scheme of Domestic Capital Growth by Exploration work with a Western Junior Company**

### 3-7 Training Human Resources

Georgia education level is high. Their level of knowledge is also high. The economic basement has been constructed since the former USSR era. However, with the advancement to a free economy market, spreading of IT, efficiency, internationalization, systematization, etc. have become indispensable factors for the participation in a common market. Suitable training of human resources is needed in each level and field on the recent situation, which is required by stronger competition. Looking at the recent situation in Georgia, language is a hindering factor for sending information, gathering information and internationalization. Training of human resources is of great importance for the younger generation on English education, management in a free economy market, IAS that has become a common standard in the world, and usage of IT are needed to be carried out systematically. The training of human resources is desirable to expand on a national level by creation of an education system to its members of society and raising managers (for example, English class to members of society by radio broadcast, etc.). Education related to the mining industry based on economic view, recent condition of mining industry, new technology of mining industry and education of mining business are needed to people related to the mining industry (Table 4-5).

#### a. System of Training Abroad

- Survey of system of each country and international organization (Appendix II) and its constructive usage (the request on the type of proposal).

Examples follows.

- Training plan raising business leaders
- International training of candidates from top ranking government officials
- On-the-job (OTJ) training at foreign mining industry company for people related to the mining area within the permissible limits of the international organization and each country training system. OTJ at the site of the mine and smelter such as Japan and EU and advanced country of mining industry such as Canada, Australia and US (in Japan there is a system of overseas expert training cooperation (JODC), etc.).
- Establish of system for training abroad by Georgia government (budgeting by Ministry of Economy, Industry and Trade)

**Table 4.5 Main Items for Education of Each Area and Layer of the Human Resource Organization for Education**

Target	Important Items of Education	Method of Education
Candidates of top ranking government organizations related to the mining industry	English, International accounting standards (IAS), business management, business systems, mining business	Seminar, overseas training
Young researchers of research and development organization	English, method of research and development, IT	Overseas training , international exchanges
University students	Mineral economics, economic environment, environmental management	Scholarship, instruction by an expert or professor from overseas for a short term
Top ranking candidates of mining industry companies	English, IAS, business management, planning, mining business	Instruction by Western expert, observation of overseas company
Engineers of mining industry company	English, quality control, process management, systems engineering, IT	Instruction by Western expert, overseas training in a company

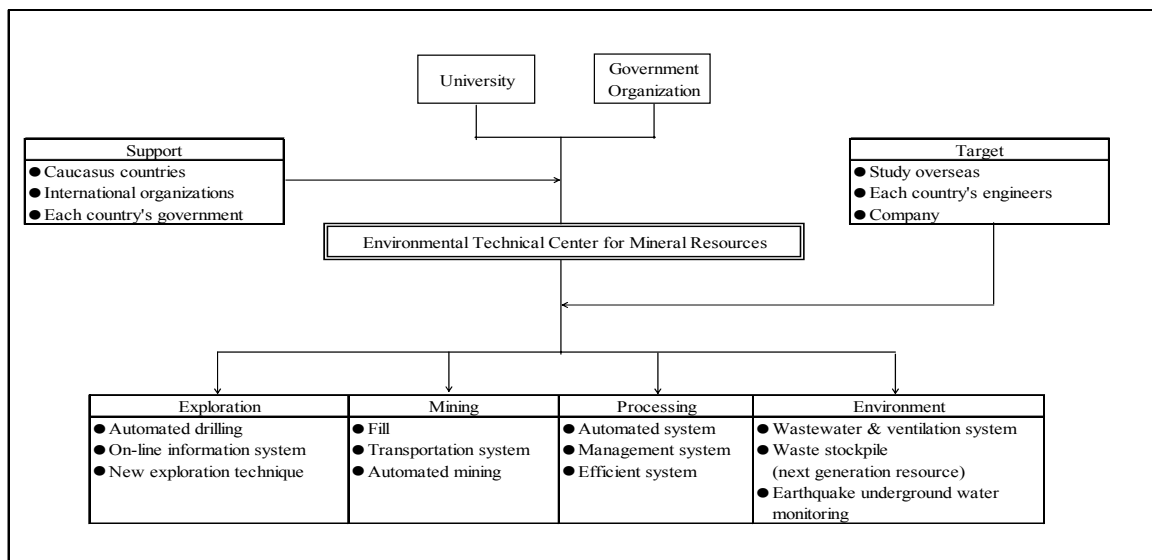
b. System for Invitation of Experts

- Mining industry education and business education by introduction of dispatch system of expert or professor from international organization and each country (Needs to request to each country and international organizations).
  - Economic mineral resources
  - Environment economics, environment of mining industry
  - Business management
  - Finance for mining industry, IAS for mainly mining industry
  - Whole mining industry
  - Mining industry technology, using IT to mining industry
- Establish system of introduction for expert by Georgia Government (budgeting by each ministry, agency and organization, mining fund, etc.)

c. Hold Seminar and International Exchange

- Hold seminar by international organization, each country's NGO, international mining association, and each country's mining organization for example, the following theme is considered.
  - Sustainable development for Mining Industry (including mining policy)
  - Contribution to the economy by promotion of exploration and development

- Harmony between the environment and production of mining industry
  - Investment for the mining industry
  - Development way for medium- to small-scale mine in mining industry trend with globalization.
  - Participation of younger generation related to the mining industry in international seminars (necessity of raising funds by improvement of management at the Madneuli Mine).
- d. Establish an Environmental and Resources Technical Center by the Improvement of Mining Facilities of the Georgia Technical University
- The department of mining at the Georgia Technical University has a tunnel in the basement of the school building (total tunnel length 1,000 m, refer to Appendix II and Progress Report), and this facility has been used as a place for practical education and research and testing for mining technology. This is a rare education facility. However, presently, the equipment and machinery for education are superannuated. Therefore, this facility has become less used as an educational facility. The establishment of an environmental research technology center is desirable as a place for technical development and training of engineers in the environment and mining industry for the whole Caucasus region (support from international organizations and each country) (Fig. 4.5).



**Fig. 4.5 Image of the Environmental Technical Center for Mineral Resources**

- Arrangement of tunnel, renewal and newly-establishment of equipment, machinery and facilities.
- Usage for an education place of engineers of each country and the Caucasus area.
- Development of technology for underground mines.
- Usage for environmental technology.

### **3-8 Arrangement of Introduction of Stable Foreign Capital**

The introduction of foreign capital to state companies in the arrangement term of the first stage is difficult if there is no improvement of the tender conditions, no resolution of the risk of the environmental problem. To arrange the circumstances of investment on the introduction of foreign capital is subject at this stage. Introduction of foreign capital to exploration and development has a high possibility compared to state mines.

It is indispensable for the introduction of foreign capital that a system of law with consensus in the international society, tax system without becoming brake on the company management, transparency and simplified procedure for investment, using IAS, guarantee of investment, disclosure of information and financial system should be arranged. The concrete contents for these points were mentioned already. The Georgia side should carry out positively to acquire the methods and knowledge of business in a free economic society, to grasp the trend in the mining business in the world, to send information and do international exchanges.

### **3-9 Market Survey**

Especially non-ferrous and gold in products by the mining activity are international commodities. Copper concentrate of the Madneuli Mine has been sold exclusively to smelters by Glencore, a Swiss company. The sales contract will be terminated in 2003. If Madneuli Mine can sell their concentrate by themselves, it will be linked to the improvement of management. For realization of this matter, Madneuli Mine needs to find a smelting plant to sell their concentrates as a target for a long-term sales contract of copper concentrate. Madneuli Mine must grasp the trend of the market for making a production plan soon. Chiatura Mine still has lost its manganese market of the former USSR era. It is needed to secure a market for the future reconstruction of the Chiatura Mine. Therefore, a market survey for the products and concentrate of copper and manganese should be carried out. The production plan and guiding principle should be based on the market survey. The survey by the Georgia side is difficult. It is desirable that the survey is done by an expert from the EU or US based on the support of an international organization be realized. A future subject is to raise a domestic trading company. A domestic trader can trade by

having the same position as the domestic mine and they can make a contract that gives advantageous conditions and information on the market for the mine.

**Table 4.6 Outline of Market Survey for Manganese and Copper**

Market Survey	
1. Target metal	Manganese, copper
2. Target products	Manganese: concentrate, ferromanganese, manganese dioxide, silicomanganese Copper: concentrate
3. Target Area of Survey	Western Europe, Eastern Europe, Turkey, Armenia and Georgia
4. Items of Survey	<ul style="list-style-type: none"> <li>• Demand amount of each country, supply of the above metal concentrate and products</li> <li>• Copper demand and forecast</li> <li>• Manganese demand and forecast</li> <li>• Potential user of Georgia's products, amount and price.</li> <li>• Copper and manganese applications and recent situation on the applications to development</li> <li>• Transportation method and cost</li> <li>• Selling conditions</li> <li>• List of metal traders</li> </ul>
5. Recommendation for production plan of manganese and copper in Georgia	
6. Survey term: 6 months	

#### **4. Promotion Measures of the Production Field in the Mining Industry**

##### **4-1 Exploration System and Basic Plan of Exploration**

The exploration system should be established to achieve the production target for promotion of the effective use of the underground resources possessed by the government. The exploration activity with an independent of mining industry company attempts to be realized on the independent and growth term of the third stage. The exploration system is a 3-step method. The government support of a mining industry company by subsidy, etc. for a part of the exploration expense is according to its risk. A joint venture with foreign capital is given a subsidy to the domestic capital company for their share of the exploration expenses. The government settles the exploration plan according to the production target and concrete ore reserves for the development target which should be acquired.

#### **a. Exploration system**

The exploration system is a system becoming a possibility to carry out exploration by domestic capital in the master plan of the mining industry for 15 years. The source of the fund is from the mining fund. The role of exploration activity between the government organizations and private company is clarified. Exploration is promoted as a 3-step method composed of a regional survey (whole amount of money is borne by the government), general and detailed exploration (support by subsidy, exploration by private company) and confirmation exploration (exploration by a private company, support by loan). The exploration system should be enforced by the establishment of a mining fund on the reconstruction and arrangement term of the first stage. On the development and basement structure term of the second stage, the active use of the exploration system by a private company becomes promoted. On the independence and growth term of the third stage, independent exploration activity is mainly by a private company. The amount of the subsidy is reduced.

- **Regional survey** To select a potential area and realize exploration targets, a survey is carried out and fully funded by the government. The survey plan is drafted up by government mining industry organizations and the survey work will be ordered to a private mining industry company.
- **General • detailed exploration** Target of the subsidy of general exploration is for drilling, geochemical, geophysical and geological surveys, etc. The amount of the subsidy is 1/2 of the cost of exploration. The target of the subsidy of a detailed exploration survey is drilling and making a drift, etc. The amount of the survey is 1/2 of the cost of exploration.
- **Confirmation exploration** The target area of the confirmation exploration is the surrounding area of a mine. Confirming (C → B) of the ore reserve and confirmation of the grade and shape of the ore deposit is carried out mainly by the confirmation exploration. The target of the loan or subsidy is drilling and making a drift. The loan is basically a low interest loan. The repayment of the principal is delayed until after the exploration period. The government mining industry organization owns exploration equipment (drilling machine, geophysical equipment) and drift making equipment (drilling machine, loader, generator, pump, etc.), and manages the equipment. The organization leases the equipment to the mining industry company who carries out the exploration.

#### **b. Exploration of Bolinisi Area and Other Area**



On the first stage of the term of reconstruction • arrangement, it is difficult to spend money from the national budget on an exploration fund until the mining fund is established. Exploration technology is still not modernized. Government organizations and mining industry companies depend on foreign capital to carry out exploration. However, sustainable exploration activity is indispensable for the development of the mining industry. Therefore to break away from the stagnant condition of the present exploration activity, the introduction of technical cooperation program (technical cooperation survey of mineral resource development) from Japan, etc. is needed. The Bolnisi area of southern Georgia has a high potential for the existence of a massive sulfide deposit composed of mainly copper and gold on a small-medium scale because Madneuli mine is operating on the same type of deposit (Fig. 4.6), refer to Progress Report 2 Appendix 1). The Ajaria area of southwestern Georgia has a high potential area of existing gold deposit on a small-medium scale. These areas are the target of the technical cooperation program (Table 4-7).

#### **c. Basic Plan of exploration**

To acquire ore reserves with future balance with production is important for sustainable development of Georgia mining industry. The systematic and effective exploration method should be based on the guidance of existing exploration results of geological mineralogical conditions for acquiring ore reserves. For the production target on the 15 years master plan of the mining industry, the exploration basic plan composed of three stages showing target figures for acquiring ore reserves of each area and the transition of development and production become the framework for the future exploration promotion (Table 4.7). The role of government organization is to make a direction. The exploration activity has a free economy function. The activity should be based on a free economy by the private sector. The drafting of the exploration plan for each stage with a concrete breakdown should be made based on the geological structure and analysis of the existing position of the deposit, etc. On the other hand, consideration of the trend of the demand in a free market economy also is needed.

- Copper and gold are the kind of metals for an exploration target
- Porphyry and volcanic sedimentary massive sulfide deposits are the target deposit.
- Selecting a promising area by existing data
- The indicator of the acquisition of ore reserves for 15 years (as a reference) is copper 1 million tons of metal, gold 200 tons of metal.
- Figure for reference as an indicator in each stage.
 

1 <sup>st</sup> stage (0-5 years):	copper 200,000 tons	gold 60 tons
2 <sup>nd</sup> stage (5-10 years):	copper 400,000 tons	gold 60 tons

3<sup>rd</sup> stage (10-15 years): copper 400,000 tons gold 80 tons

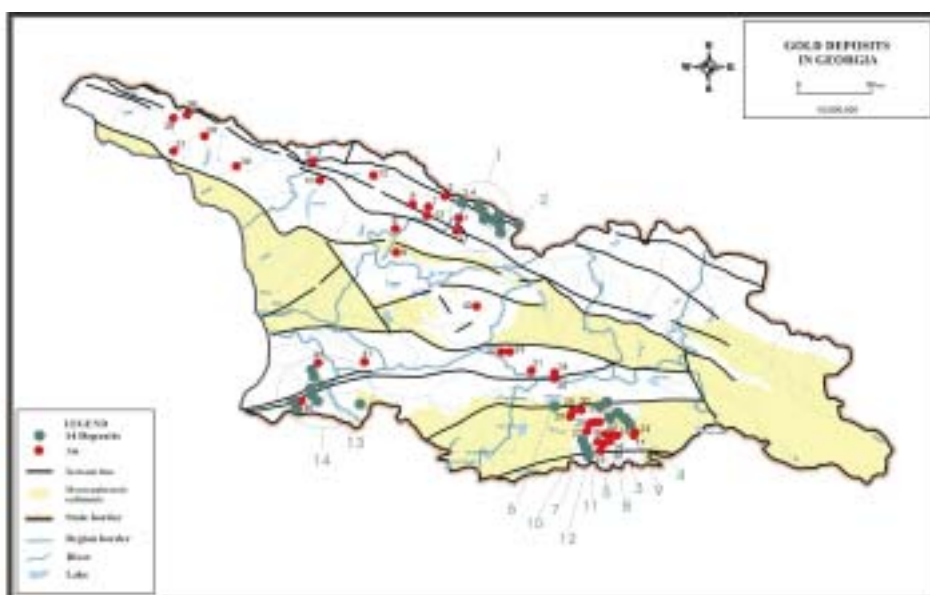


Fig. 4.6 14 Recommended Deposits for Model Mines

Table 4.7 Basic prospecting plan

Basic prospecting plan for gold deposit

		0	5 years	10 years	15 years
Domestic investment	Madneuli		5t	8t	8t
Foreign investment	Madneuli (Quartzite)		6t	Mined out	
	Sakdrisi	F/S+exploitation	4t	8t	10t
	Tsitelispeli	exploration	F/S+exploitation	5t	10t
	Merisi ore field	exploration	F/S+exploitation	3t	10t
	Guria ore field	exploration	F/S+exploitation	1t	7t
	Davit-Gareji		exploration	F/S+exploitation	3t
Domestic investment	Kemo-Bolnisi	valuation, search	exploration	F/S+exploitation	2t
	Katarkaia		exploration	F/S+exploitation	
	Tamarisi		exploration	F/S+exploitation	
	Garta		exploration		
Total			15t (3t/y)	25t (5t/y)	50t (10t/y)
Acquired gold reserves			60t	60t	80t

Basic prospecting plan for copper deposit

		0	5 years	10 years	15 years
Domestic investment	Madneuli		75,000t	75,000t	75,000t
Foreign investment	Sakdrisi	F/S+exploitation	50,000t	60,000t	
	Tsitelispeli	exploration	F/S+exploitation	15,000t	40,000t
	Merisi ore field	exploration	F/S+exploitation		30,000t
	Guria ore field	exploration	F/S+exploitation	10,000t	30,000t
	Davit-Gareji		exploration	F/S+exploitation	15,000t
Domestic investment	Tamarisi	valuation, search	exploration	F/S+exploitation	
	Garta		exploration		
Total			75,000t (25 thn t/y)	150,000t (30 thn t/y)	250,000t (50 thn t/y)
Acquired copper reserves			200 then t	400 then t	400 then t

Mining Fund	Trial systematization	Prospect work by Fund	Fixation of Fund
Foreign or domestic investment	Prospecting led by foreign investment	Promoting domestic investment	Self-imposed development

## **4-2 Model Mine and Promotion of Development**

The competitiveness of existing mines in Georgia is poor in a free market economy because of taxation, technology, quality of products, condition of existing deposits, size · grade of ore reserve, old style facilities · system, sustaining welfare facilities, condition of the mine site, etc. Construction of a small-medium scale mine with competitiveness (compact mine refer to mining seminar document in January 2002) is an important subject in Georgia, where generally small-medium scale deposits exist. Strengthening the competitiveness of small-medium scale deposits is indispensable for the survival of the Georgia mining industry and development in the mining industry of the world, which is increasing its share of the supply of large-scale mines with large production. The development is needed to be promoted by acquiring competitiveness with the construction of a model mine and transferring of technology for the development of small-medium scale deposits, method of management, quality control, etc. from the model mine.

### **a. Model mine**

A model mine should be selected from the potential area having resources of copper and gold such as Bolnisi area. The model mine is needed to become the core mine in the mining industry in the area. A target deposit which is selected as a model mine should be judged by its location, scale, ore reserve and grade, potentiality of the surrounding area, feasibility, etc.

It is better that the model mine is developed and managed as a cooperation business by a government organization, private company and university under the management of the government mining industry organization. Tsitelisopeli deposit is thought as a model mine based on recent information. But there are many deposits in the Bolnisi area so a concrete detailed study of existing documents should be carried out with a comprehensive view (including groundwater effect on mining activities).

#### **a) Main subjects**

- Evaluation of deposits, new technique such as a feasibility study.
- Trackless mining system in the case of underground
- GPS transportation system
- Dressing on-line system
- Human resource training for engineers and managers through on-the-job training.
- Minimization of the tailings dam.
- Modern management system.
- Countermeasure of environment and system of environmental management.

#### b) Outline

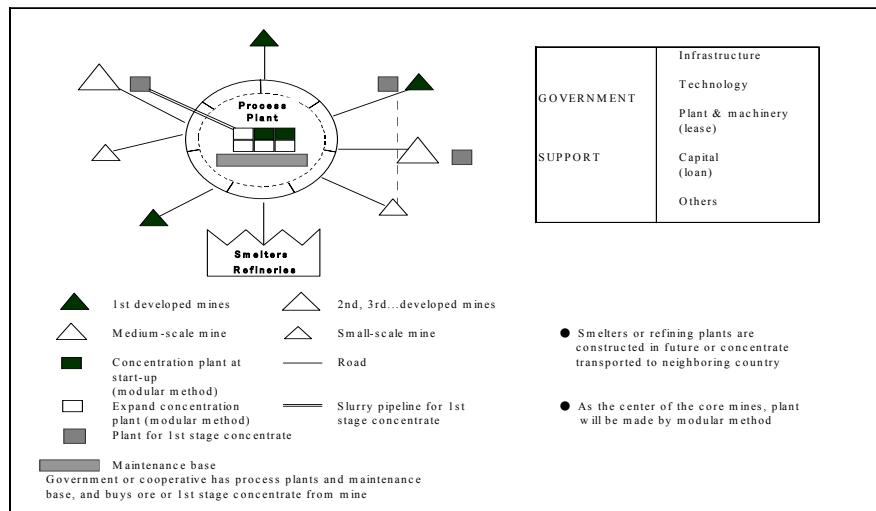
The model mine will be developed with the following order; selection of a target deposit → evaluation of deposit → pre-feasibility study → additional exploration → decision of development → engineering → construction → operation. The model mine assumes a business organization like a Model Mine Agency that is established and operated. The model mine should be an organization managed by the private sector in the future and should be tax-free for 10 years after the start of the development construction. The model mine is privatized on the term of independent growth of the third stage and with the construction of the management basement after 10 years from the start of the master plan. A mine is developed as a result of exploration activity around the model mine and constructed to a network jointly owning the processing plant (transportation equipment) with the model mine (Table 4.8, Fig. 4.8).

- Tax exemption for 10 years
- Development base of various mining technologies
- Network system with surrounding mines
- Base for making regulations through production activities
- Train managers by domestic capital
- Model of countermeasures of environment and management

It is indispensable for the raising of money and acquiring advanced technology and knowledge from Europe and US. It is needed to acquire development technology in a free market economy by ordering experts in the (introduction of technical cooperation) or companies of Europe and US about the evaluation of a deposit on each work and feasibility study. As the organization of raising money, the mining fund based on the source money from taxes, etc., a soft loan from an international organization and each country, and a loan from the Central Bank are considered (Table 4-8, Fig. 4-7).

**Table 4.8 Outline of Model Mine**

<b>Model Mine (Rough Idea)</b>	
<b>1. PURPOSE</b>	<ul style="list-style-type: none"><li>• Creation of a strong competitive mine in a free market economy that will play a role as a core, improve economy and increase the employment level.</li><li>• Development of small-medium scale deposits, introduction of effective technologies</li><li>• Practical introduction of management and control systems</li></ul>
<b>2. SUBJECTS</b>	<ul style="list-style-type: none"><li>• Gold and copper deposits of small-medium scale</li><li>• Deposits with proven reserves for 5-10 years (company or agency related to the government has the mining right)</li><li>• High ore potential region</li></ul>
<b>3. FUNDING AND TECHNOLOGY</b>	<ul style="list-style-type: none"><li>• Credits on ODA (Overseas Development Assistance)</li><li>• Credits on Central Bank with government guarantees</li><li>• Introduction of advanced mining technologies from Japan and other advanced countries (by ODA's assistance)</li></ul>
<b>4. BUSINESS AGENCIES</b>	<ul style="list-style-type: none"><li>• Model Mine Agency</li><li>• Agency's members: Ministry of Economy, Industry and Trade, Ministry of Environment Protection and Natural Resources, State Department on Geology, Mining Mechanics Scientific Institute and State Inspection on Technical Supervision.</li></ul>
<b>5. BUSINESS MAINTENANCE</b>	<ul style="list-style-type: none"><li>• Evaluation of deposits, F/S, examination of environmental impact</li><li>• Engineering</li><li>• Development works, mine administration and operation (total- 10 years)</li></ul>
<b>6. SPECIAL GOVERNMENTAL MEASURES</b>	<ul style="list-style-type: none"><li>• Tax exemption (within 10 year period starting from development)</li><li>• Permission of development licensing (mining right)</li></ul>



**Fig. 4.7 Development Scheme for Small-medium Size Deposits in the Ore District**

#### b. Promotion of Development

The expenses for acquiring ore reserve • grade, feasibility study after ore reserve evaluation, dressing test, engineering and construction of development needs finance as a loan by the mining fund for the promotion of development. The loan at each stage is implemented by the establishment of a loan system for the promotion of development. This loan is long term with a low interest rate. Development capital is needed for the introduction of cooperation loans with international organizations such as IFC and EBRD, etc., and from private banks. A guarantee system is needed to realize a loan from IFC, EBRD and private banks. Supply system of interest and government guarantee system needs to be concreted.

### 4-3 Reconstruction and Rationalization of Mine

Among the Madneuli, Chiatura and Uravi mines, the Uravi mine has been in a condition of suspension since 1992, but the restart of production is difficult because of a loss of the arsenic market, superannuated facilities, damaged equipment and machinery and old technology. Environmental protection is a condition to re-open the mine. Therefore the mine is better to be closed by carrying out a countermeasure for the protection of mining pollution as a target of closing the mine. The Chiatura mine should be studied for its ability to operate on a suitable scale that meets demand and its ore reserves by carrying out measures of reconstruction and rationalization to recover its production. Although the productivity of the Madneuli mine is recovering, the mine has a priority subject for the reconstruction of its production basement such as the increase of mineable ore reserves,

improving the dressing ore grade and renewal of facilities and equipment.

Now the reconstruction of these mines is difficult by themselves. Therefore a supporting measure for reconstruction and rationalization by the government is needed for reconstruction of the basement of production and management.

a. Supporting reconstruction and rationalization

- Separation of the welfare facilities. Management or the disposal of surplus facilities such as energy supply facilities, company housing, etc. by a third party. Reduce expenses by these measures.
- Loan for renewal money for facilities and equipment, etc. Long-term loan from the mining fund, etc.
- Consulting of management, quality control technology and technology on the reduction of energy. Technical cooperation of experts sent by international organizations and each country such as Japan, etc.
- Privilege of taxation.
- Install facilities of environmental management.
- Loan of rationalization. Target is education of human resources and IT field, etc.
- Using of information from the Internet for production, management and administration.

b. Measures of reconstruction of Madneuli mine

- Introduction of international accounting standards.
- Revision of regulations (passport) for expansion of mineable ore reserves.
- Grade control for mined ore and rationalization of transportation system.
- Analysis of profitability of each sector and concretion of items of cost reduction and its method.
- Improve concentrate grade (over 20%).
- Review of sales condition of concentrate. Re-evaluate gold grade.
- Renew facilities and machinery, etc.
- Automatic measuring instruments and equipment, etc Study of feasibility of rationalization of human resources.
- Separate and user's cost (charge) or disposal of welfare facilities.
- Study of method of transportation for concentrate.

c. Measures of reconstruction of Chiatura mine

- Concentration of the mining places for improvement of the transportation system and method.
- Renewal of facilities and equipment

- Concentration of the dressing plants and mines.
- Study of integration of various kinds of concentrate.
- Analysis of profitability of each sector and concretion of items of cost reduction and its method.
- Reconstruction consistent with the system of business with JSC Zestaponi Ferro Alloy.

#### **4-4 Environmental Management of Mine**

The environmental problems of the mine are not grasped by quantitative analysis. The environmental management such as wastewater, waste rock and tailings, etc. is insufficient. The administration of the environment seems not to function for its management. The pollution of acid water and heavy metals in the river and soil is estimated to be expanding in the surrounding area of the mine. The supporting measures of environmental management to a mine are needed for strict observance of environmental standards and discharge standards.

- Construction of tailings and wastewater treatment system.
- Monitoring analysis of wastewater (once daily).
- Restoration, maintenance and inspection of wastewater treatment facility.
- Recovering metals from wastewater and through the treatment of neutralization of wastewater.
- Dust treatment, restoration, maintenance and inspection of the facility for protection of scattered dust. Measurement of dust in the air (once a month).
- Arrangement of management system for pollution from activity in the mining industry.

The facilities and equipment needed for the countermeasures for pollution from activity in the mining industry are required to be installed by money from the mining fund by the establishment of the system of subsidy and loan. The environment management system will be established by making measures for the reduction of fixed assets tax or accelerated depreciation.

#### **4-5 Information Disclosure (public information)**

The documents and data on mineral resources are put into order and safely kept. These documents and data are disclosed. It is possible to read and borrow them. However it is difficult for foreigners to access them because they are written in Georgian and Russian. Almost all the data and documents are the reports and exploration, etc. Therefore much time is spent to retrieve the information. The method of retrieval is not



arranged by using a computer. The practical use of information disclosure with information processed by the introduction of IT (Information Technology) is being expanded presently in the world and linked to the promotion of the mining industry for the promotion of exploration and development by the introduction of foreign capital and reduction of exploration risk by the effective use of the existing data and documents. To provide information by a web site and arrange the information by a database system are thought as the concrete measures related to the information disclosure. GIS system construction based on database is used for comprehensive analysis of data and information. It is effective for drafting a plan, etc. of mineral resources development by a government organization. It is linked to drafting a comprehensive plan of national development (Fig. 4.8).

a. To provide information by a web site

The mineral resources information of Georgia is disclosed by a web site. The information related to the mining industry such as the introduction of Georgian mineral resources, method of acquiring licenses, procedure of investment, mining code and tax system, etc. are provided for foreign capital (investor). To provide information by web site is mainly to give a chance of investment by raising the interest of Georgian mineral resources from the web site for foreign investors. Plan and contents, which give interest to foreign investor, which makes investor eager to invest for the short term, is needed with a simple introduction of a summary of undeveloped resource information with model geologic map and mineralogical map. The mineral resources information is made to link with a comprehensive understanding by connecting to a GIS system and database. Web site of prototype was made by this Master Plan project will be disclosed (under construction).

b. Construction of a database

The framework of the database and data treatment as a sample is being made on this development survey to construct a database of mineral resources on a full scale that is useful not only for foreign investors but also government mining organizations with a comprehensive management of mineral resources. It is also highly useful to raise domestic investors. It is needed to make it possible for grasping each mineral resource by many fields by linking with a GIS system. The database with high usage should be constructed by the framework of the database on this development survey. It is thought to realize it by the introduction of a technical cooperation program of Japan (development study of database construction on mineral resources) and assistance from international organizations.

- Re-editing by digitization of mineral resources data (in English).
- Linking system between the database and GIS.

- Arrangement of hardware and software.
- Construction of maintenance and management systems of database and supplemental system of data.
- Target of database in the future include geology, mineralogy, geography, remote sensing, geophysical exploration, geochemical exploration, hydrogeology and infrastructure, etc.

c. License management system

The Ministry of Environmental Protection and Natural Resources is the administrative organization for the licensing of underground resources. At present about 400 licenses (exploration license, mining license) are managed. However, it is not systemized. There is no form for the application of a license. Documents submitted by the applicant are filed. Arrangement is needed by the introduction of GIS about maps such as application map, license map of geology of the license territory, and map of plan for exploration and development for submitting with a standard format and confirmation map of the license territory after making a database by making a formal application (Appendix I).

- Establish a system by digitization for administration work of license registration.
- Application for the administration of the license application registration based on the database system by the technical transfer of this survey.
- Introduction of computer management system including a digital map by using GIS software (TNT-mips), which was introduced by this survey, was supplied as equipment.
- Information disclosure by a mining web site linked with a license registration system.

d. Construction of GIS system and web GIS

The GIS system is efficient for the comprehensive analysis of a variety of data and information and useful for drafting resources and investment strategy. GIS can expand its area by linking data and information on the environment, disaster protection and vegetation. If a system linked between the web site and GIS were constructed, it would be an efficient method for analyzing and studying by increasing information with volume and quality, which is provided to investors. It is desirable to obtain support from international organizations with the construction of the database.

- GIS system construction based on a database.
- Disclosure of information by web site linked to GIS (web-GIS).
- Comprehensive system with linking to environmental protection and disaster protection.

- Service to investor. Tool for drafting plan of government.

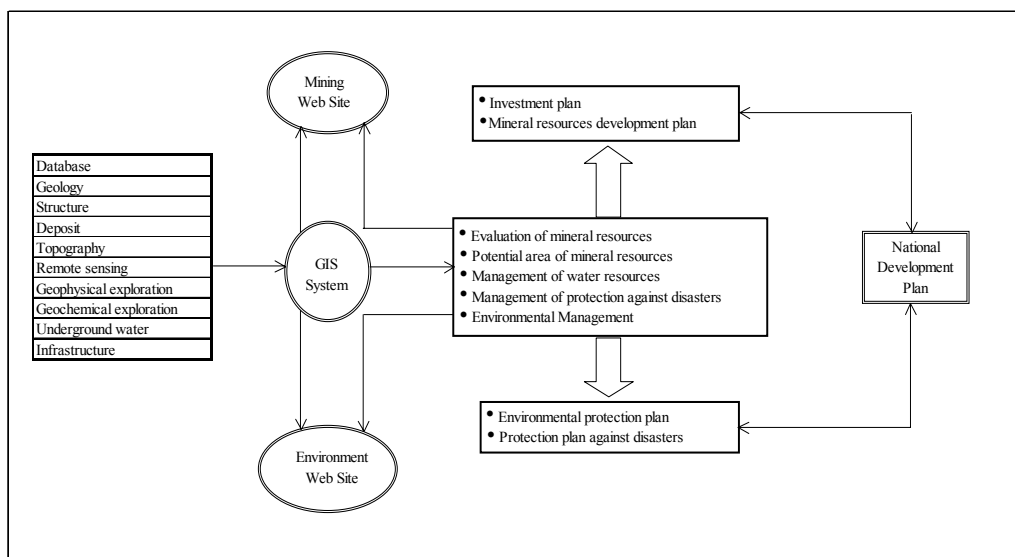
e. Improvement of Geological Maps

A geologic map is a basic map, not only for resources area but also for the environment, disaster protection, forest and agriculture areas, etc. The present geological map was made and surveyed in the former USSR era. It is needed to improve the geological maps by survey based the recent theory on the history of the development of structural geology and to digitize the data.

It is efficient for the construction of the management basement by an order from the government or international organization to a survey company, which was privatized and became independent from the State Department of Geology.

- Improvement of the base map (1;50,000, 1;200,000, 1;1,000,000) including parts of surveys.
- Practical use by GIS system by digitalization.
- Using a variety of areas.

Realization of promotion measures related to the above information disclosure is difficult by themselves because of the financial condition of the present Georgia government. It is desirable to have the support as a package project by the technical assistance and loan from an international organization, based on a study to realize efficiency.



**Fig. 4.8 Scheme for Arrangement of Information**

#### 4-6 Mining Fund

Finance is the most important subject for the realization of the promotion measures of the mining industry. The establishment of the mining fund by the government itself is

difficult because of a lack of national budget, having a chronic deficit on the balance of national finance and having much debt. Therefore the assistance of a loan from each country such as Japan, etc. or international organization is needed to be part of the source of the fund. Also the huge finance should be studied as a loan by international organizations or private banks. This fund should be realized in the early term. It is attempted to estimate in the term of reconstruction and arrangement of the first stage. The mining fund is better to be abolished with development in the independence and growth term of the third stage (Table 4.9, Fig. 4-9).

a. Subject

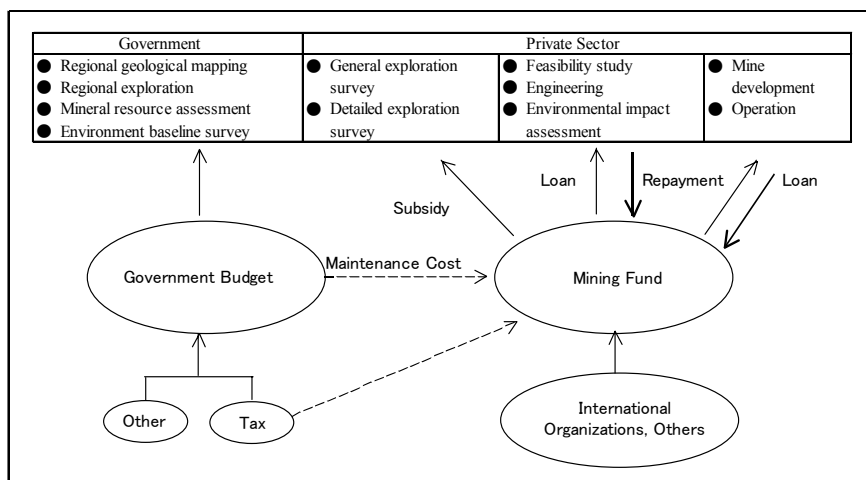
- Method of finance, amount of source and amount of supplement.
- Method of operation and management.
- Target of loan, term and conditions. Method of repayment of principal, term and conditions.
- Operation regulations of the mining fund.
- System of subsidy.

b. System for target of mining fund

- Exploration system (subsidy, loan).
- System of loan for development promotion (feasibility study, engineering, development construction).
- Loan system for reconstruction rationalization (renewal of machinery, etc.), restoration).
- Countermeasure of protection for mining industry pollution from closed mines and reconstruction of mining industry company (all expenses paid from the donation of the mining fund, subsidy, loan).
- Management system for environmental countermeasures (subsidy, loan).
- Government guarantee system for loan from private bank (rationalization, improvement of production facility).

**Table 4.9 Outline of Mining Fund**

<b>Mining Fund</b> <b>(Draft)</b>	
<b>Fund financial sources:</b>	two-step credit (\$30 mil USD), tax revenues, credit from international organization
<b>Supervisory bodies:</b>	Ministry of Finance, Committee on Mining Fund
<b>Consideration of crediting issues:</b>	Advisory Committee- members of Committee on Mining Fund, related ministries and institutions
<b>Sponsored units and organizations:</b>	State bodies, state-owned mines and enterprises, private companies (based on conclusions of the Advisory Committee)
<b>Sponsored items:</b>	<ul style="list-style-type: none"> <li>• For subsidies on exploration</li> <li>• Expenses of development 米</li> <li>• Expenses related to procurement of equipment and machinery 米</li> <li>• Environmental countermeasure 米</li> <li>• Rationalization and modernization of administration 米</li> <li>• Utilization of by-products, business for making resources from waste 米</li> </ul> 米 loan
<b>Financing conditions:</b>	<ul style="list-style-type: none"> <li>• Same interest rate as loans provided by ODA (Overseas Development Assistance)</li> <li>• Definition of terms, amount and repayment period</li> </ul>
<b>Fund administration:</b>	As the fund's budget is reduced, the reduced part shall be covered by future tax revenues Fund administration will be assigned to the Committee on Mining Fund
<b>Commodity metals-business units:</b>	gold, copper, zinc, silver, manganese (list will be expanded in the future)



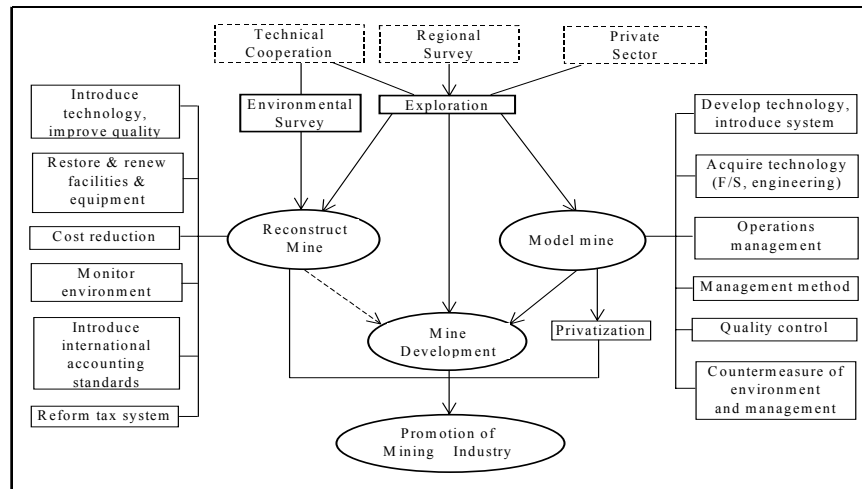
**Fig 4.9 Government Role & Mining Foundation for Exploration & Development**

## 5. Subject for Realization of Promotion Measures on Mining Industry

### 5-1 Relation with Measure of Promotion and Promotion of Mining Industry

The mining activities of Georgia having a stagnant condition by realization of promotion measures will make it active and it is linked to the contribution to the improvement of the national economy, international balance of payments and growth of economy. The main promotion measures based on mining policy are the reconstruction of mines, promotion of exploration and development. Also, establishment of the mining fund, and construction of the model mine for supporting the above measures are important. Assistance from international organizations and some countries is indispensable and important for realization of these measures. Promotion of exploration is linked to development. Technology with competitiveness, environmental countermeasures and control, management, management of production are practically carried out by the construction of the model mine. The development and production having balance with the environment is promoted by this construction. The promotion of the mining industry is being realized with the forming and accumulation of domestic capital by the above measures (Fig. 4-10).

- Main promotion measures are the reconstruction of mines, promotion of exploration and development, establishment of mining fund and construction of a model mine.
- The pillar of promotion on the mining industry is the reconstruction of mines and promotion of mine development.
- Promotion of the mining industry by the realization of effective relations with the promotion measures.
- Assistance from international organizations and each country is indispensable for the promotion of the mining industry.



**Fig. 4-10 Relation Between Measure and Promotion of Mining Industry**

### 5-2 Investment Scale to Promotion Measure

A huge finance is needed for the promotion of the mining industry by realizing the promotion measures. The investment scale on the implementation term of the master plan for a 15-year period is US\$400 million on a very rough estimate (ballpark) (Table 4.10). The investment scale is roughly estimated on the first stage at US\$100 million, second stage at US\$200 million and third stage at US\$100 million. This money should be financed by loans from international organizations, each country, foreign capital, Georgia government (tax revenues, treasury bonds) and domestic capital investment. Concrete effective investment of the investment amount and the terms of repayment of the loan, etc. are needed to study each promotion measure for target of investment. Also the method of finance should be concreted.

- Achievement of over 10% GDP.
- Activation of local economy by mine development (secure employment, raise a variety of industries related to the mining business).
- Increase of tax revenues (make tax system sound).
- Increase of domestic capital (strengthen the power of investment by independent capital).

**Table 4.10 Rough Estimate of Investment Scale for Long-term Period  
of 15 years Based on Master Plan**

SIMPLIFIED REPRESENTATION OF THE INVESTMENT SCALE FOR LONG-TERM PERIOD OF 15 YEARS			
1. Investment Scale			
	Promotion Measure	US\$ (mln)	Effect
Reconstruction	Madneuli mine	5	Recover productivity
	Chiatura mine	30	Recover productivity
Environment	Investigation and countermeasure in polluted areas	10	Realize countermeasures
	Introduction of monitoring system	10	Establish environmental management system
Exploration &  prospecting	Surveys and geological prospecting supported by the government (ODA)	15	Select promising area
	Exploration by private companies	50	Acquiring ore deposits for development target
	Geological maps systemization, exploration equipment	30	Establish exploration basement
Mineral deposit development	Gold mine, 5 mines x 1 t/yr	80	Revenue US\$ 50 mln/yr
	Copper mine, 2 mines x US\$5,000,000	100	Revenue US\$ 100 mln/yr
Model mine	F/S, construction	40	Strengthen competitiveness
Metallurgical  processing	Reconstruction of Zestafoni manganese Smelter	20	Recover productivity
	F/S for gold refining, copper smelter and zinc smelter	10	Consistent system, make manufacturing industry
Total:		US\$400 million	
2. Financial provision			
Mining Fund	ODA + tax revenue	US\$50 million	
ODA	ODA Loans + technical cooperation	US\$40 million	
Government	Tax revenue + T-bill + National bond	US\$100 million	
Foreign Investments	Exploration, development	US\$130 million	
Domestic Investment	Securities market, banks	US\$80 million	
Total:		US\$400 million	

### 5-3 Assistance Program and Promotion Measure

International organizations (WB, EBRD) and each country like Japan (JICA, JBIC), etc. have assistance and supporting programs for various fields. It is better to study the introduction to the project (promotion measure) to be possible that applies to a program in these programs on the promotion measures (Table 4.11). The realization of the introduction should be attempted by the concretion of promotion measures on the study of these measures. Mining organizations should make an effort for the introduction by survey of the assistance program of each country, international organization, and by studying the possibility for realizing the promotion measure of assistance program. EU-PHARE is a fund for the reconstruction of East Europe. The Georgia government is now requesting as a target country for using this fund. If Georgia is recognized as a target country for this fund, EU-PHARE will become a powerful assistance fund for the



mining industry promotion. EU and World Bank have implemented already support for an environment project with the target of three countries of the Caucasus. The creation of an assistance project for the three countries of the Caucasus in the mining field and realization of these supporting projects from international organizations are the subject for studying from now on.

**Table 4.11 Example of Program of International and Japan Aid for Project on Assistance to Promotion of Mining Industry**

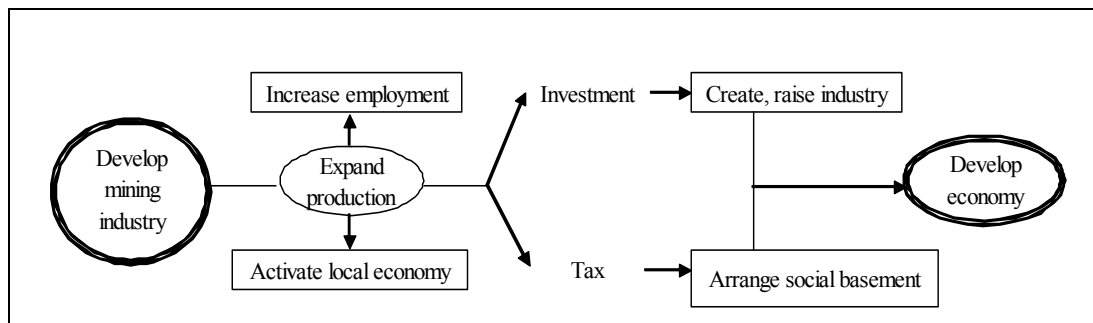
Organizations	Type of Assistance	Program	Project	Issues
<b>JICA</b> (Japan International Cooperation Agency)	Technical Cooperation	Development Study	<ul style="list-style-type: none"> <li>• Survey for potential target environmental pollution level around the Madneuli mine</li> <li>• Exploration for mineral resources in the Bolnisi region</li> <li>• Construction of mineral resources database</li> </ul>	<ul style="list-style-type: none"> <li>• Realization is strict due to JICA budget reduction</li> <li>• Georgian government must put a high priority on this project's status</li> </ul>
		Dispatching of Experts	<ul style="list-style-type: none"> <li>• Long- and short-term dispatch of experts on environmental issues and mining industry</li> <li>• Short-term dispatch of experts on mining code and international accounting standards</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of Japanese Experts</li> <li>• JICA budget reduction (so reduction of personnel)</li> </ul>
	Grants	Equipment Delivery	Equipment for comprehensive environmental monitoring system	<ul style="list-style-type: none"> <li>• Put priority by the Georgian Government</li> </ul>
<b>JBIC</b> (Japanese Bank of International Cooperation)	Yen Loans		<ul style="list-style-type: none"> <li>• Two-step loans (for the Mining Promotion Fund)</li> <li>• Model Mine</li> <li>• Comprehensive system of environmental monitoring</li> <li>• Wastewater treatment facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Georgia must be recognized as a country-recipient of yen loans</li> <li>• After starting the project of installation of loading equipment in the Potty port</li> </ul>
<b>Embassy of Japan</b>	Grass Roots Grants <<Kusanoie>>	<\$40 thou. USD for NGOs	<ul style="list-style-type: none"> <li>• Equipment and facility for Association of Mining Enterprises</li> <li>• Equipment for education of mining sector</li> </ul>	<ul style="list-style-type: none"> <li>• Never provided for the mining sector</li> </ul>
<b>World Bank</b>	Loans		<ul style="list-style-type: none"> <li>• Arrangement of maps</li> <li>• Countermeasure for environment</li> <li>• Database of pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Same as with yen loans, depends on solvency of Georgia</li> </ul>
	Technical Cooperation		<ul style="list-style-type: none"> <li>• Examination of arsenic pollution level and countermeasure</li> </ul>	<ul style="list-style-type: none"> <li>• Linking with credit</li> </ul>
	Grants		<ul style="list-style-type: none"> <li>• Seminar on investments</li> <li>• Consulting on mining industry (legislation, policy, organization, production technologies, environmental countermeasure, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Arrangement of investment climate is indispensable for holding seminar</li> <li>• Two weeks provided by experts of the World Bank</li> </ul>
<b>EBRD</b>	Loans		<ul style="list-style-type: none"> <li>• Cooperation loan for Model Mine</li> </ul>	<ul style="list-style-type: none"> <li>• High interest rate</li> </ul>
	Technical Cooperation	Environmental impact evaluation  TAM Program	<ul style="list-style-type: none"> <li>• For mine and development of deposit</li> <li>• Improvement of arrangement for mine</li> </ul>	
<b>EU TACIS</b>	Technical Cooperation		<ul style="list-style-type: none"> <li>• Market survey</li> <li>• Improvement of mining code</li> <li>• Arsenic environment monitoring</li> <li>• Environmental management for mining activity</li> </ul>	
<b>UNDP</b>	Technical cooperation		<ul style="list-style-type: none"> <li>• Quality control</li> <li>• Plan for environmental pollution improvement</li> </ul>	
<b>DFID (UK)</b>	Technical cooperation		<ul style="list-style-type: none"> <li>• Improvement of management for mining industry company</li> </ul>	<ul style="list-style-type: none"> <li>• Short term</li> </ul>

## Chapter 5. Recommendations

### 1. Recognition of Significance of Mining Industry

#### 1-1 Mining Industry as Engine of Economy

The 10% of GDP is the guideline in the master plan for the positioning of the mining industry. Mining is the industry contributing to the acquisition of foreign money. Its development will, through its profits, stimulate investment not only in the mining industry but also in the metal processing and other industries. Furthermore, it will lead to an increase in employment, revitalization of the local economy and an improvement as well as maintenance of the social infrastructure (Fig. 5-1). Mining industry countries have through the development of their mining industry been creating a variety of related industries, contributing to the construction of their industrial basement and expanding their economy. Japan was a mining industry country. Japan created major industries such as for machines and metal processing through investments from profits of its mining activity, which contributed to the construction of the industrial basement. The mining industry thus played a core role as the engine in vitalizing the economy in Japan. Recognizing such role the mining industry plays in expanding the economy, Georgia first needs to position mining as the strategic industry and thus, to join forces in a great effort to realize the master plan.

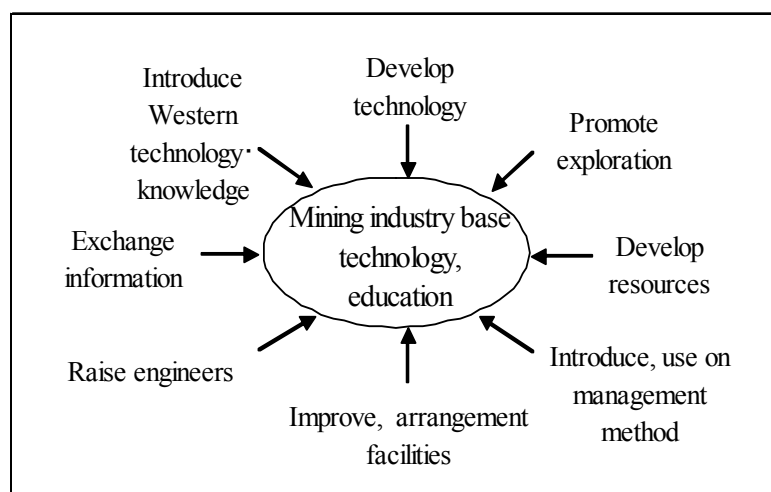


**Fig. 5.1 Positioning of Mining Industry**

#### 1-2 Maintenance of the Basement for Mining Industry

As showing the production of manganese in the former Soviet Union, Georgia was a mining country playing a significant role in the Soviet Union's economy. Possessing a large number of technicians and engineers specializing in mining, ore dressing and smelting, Georgia was establishing the basement for the relevant technologies. Georgia was through education for the mining industry also playing a key role as a training center in the Caucasus area, and has a basement for an overall education to cover all aspects of the mining industry

in the Tbilisi Technical University. With a shift to the market economy, Georgia really needs improvement and reconstruction of the basement for both relevant technology and education, but the country is now losing its basement under a decline in the mining industry. When it comes to constructing its basement, it definitely requires a considerably long period, a huge amount of money and an introduction of relevant technologies from the foreign countries to realize the program. Recognizing the significance of the mining industry, Georgia should have serious consideration to improve its current basement that is suitable for a market economy. A great effort by the country to realize such measures for buildup in the Master Plan will definitely improve and maintain the basement.



**Fig. 5-2 Improvement for Maintenance of Mining Industry Basement**

### **1-3 Acquisition of Foreign Money by Fully Using its Mineral Resources**

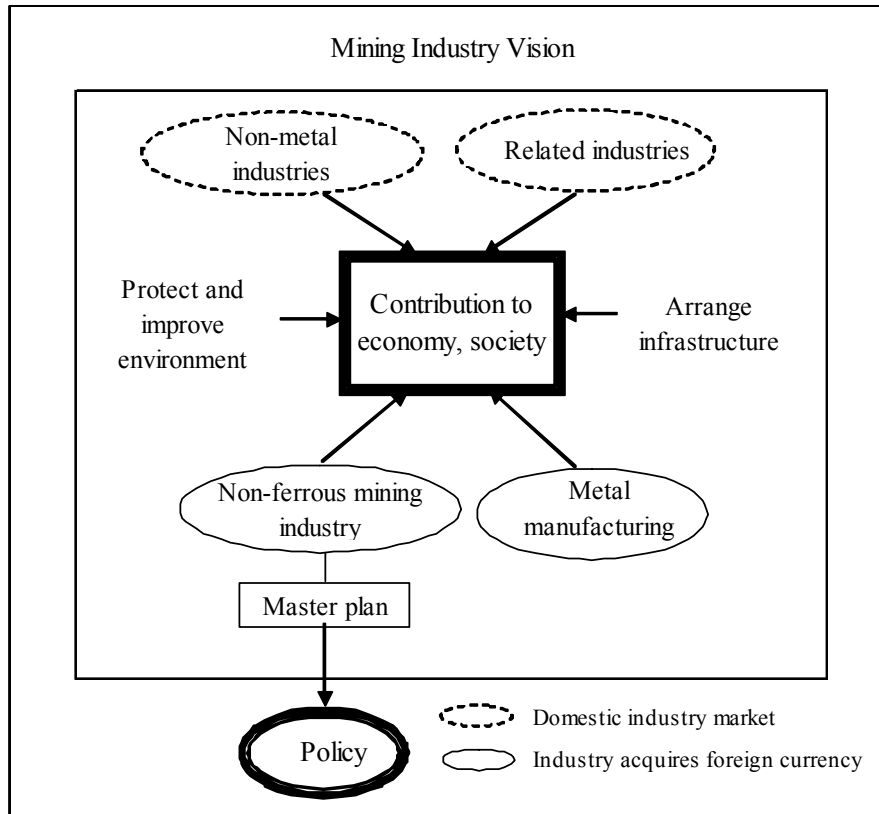
The guideline on natural resources in the master plan is for copper, gold and manganese. These are international commodities, which can acquire foreign money (hard currency), and relatively stable metals without a considerable fluctuation in their demand. Under globalization, the cost competitiveness is required for such commodities. Whether the resources can be developed to withstand the fluctuation of the market price is clearly essential to the acquisition of foreign money. The economic evaluation of its resources, and exploration aiming at a high-grade mineral deposit or a large-scale deposit in a potential area are most important to be performed. It is suggested further that mining of non-metal resources for various industrial materials can be expanded to meet the growth of industry based on domestic demand for their resources as well as the resources in neighboring countries.

- **The core of development in mining is copper, gold and manganese to contribute to the acquisition of foreign money.**
- **Development of resources should be able to withstand the fluctuation of the market price.**
- **Non-metal mining industry as a local industry based on the production and consumption in the local area.**

## **2. Necessity of Policy and Vision**

### **2-1 Policy and Vision**

In the master plan, the mining policy has been proposed. Furthermore, under the 15 years-term plan was set up the guideline as 10% of the GDP and suggested its position in the future. In the plan, however, it has been made only the basic direction that the mining industry should take. Therefore, the definite vision over the entire mining industry (Fig. 5-3) should be drawn up by those responsible people in the relevant governmental organizations and mining industry. The mining policy is the method for the realization of the vision. The policy has to be properly evaluated by implementing the mining programs, which should be amended properly to seek a reasonable direction in its path and a more suitable policy must be prepared further for implementation. Probably due to the influence of the state-planned economy under the former Soviet Union still remaining in the country, Georgia lacks actual experience in drawing up the appropriate vision and policy. Georgia needs to accumulate experience and practice in these aspects.



**Fig. 5-3 Vision and Master Plan for the Entire Mining Industry**

## 2-2 Planning

It is required to realize the policy and draw up the plan for promoting the mining industry. The short-, intermediate- and long-term plan will be essential to be drawn up for realizing the vision. To realize this program, a viable plan must be drawn up. In the master plan, we have presented three (3) stages with a five (5) year period. In the term for reconstruction and arrangement of basement as the first stage, the intermediate-term (5 years) plan, the short-term plan (1-2 years) on a basis of the intermediate-term plan and budgeting for implementing the promoting measures must be drawn up. The budget needs to be prepared as precise and realistic as possible. A request to the international organizations or countries concerned for cooperation in realizing the promoting measures should be made by the government. Furthermore, the necessity of the promoting measures (project) and their effectiveness to realization of the project also have to be closely examined.

- **Drawing up the short-, intermediate- and long-term plan.**
- **Budgeting should be as precise as possible.**

- **Close examination for the necessity and/or effectiveness when making a request to the international organizations, etc. for cooperation on the promoting measures.**

### **2-3 Improvement in the Administration Ability**

As a result of the administrative reforms implemented several times, there has been a reduction in the organization. After independence, the administrative ability as a government organization declined. As no cut was made in the jobs to meet the workforce reduction, such jobs to be performed by the government as policy planning and making, administration, guidance, etc. still remain that do not correspond completely for the execution by the administration. There is some former Soviet Union influence on the systems that still remain so the government administration still fails to fully meet what it should do under a market economy such as control mine claims, procedures of application and investment, approval by the committee for ore reserve and permission and/or authorization for development. Such subjects as an improvement in the systems of office services, a simplification of administrative jobs and an improvement of the administrators' ability also have to be fully recognized in the ministry, agency and governmental levels and improve the overall administrative ability should be carried out. The wage level of the bureaucrats remains low and thus, an improvement in the wages for bureaucrats is also to build up the bureaucrats' competency.

**Table 5-1 Plan for Improvement of the Administrative Competency**

Items	Measures for Improvement
Office Services	IT networking in the ministries and agencies
Permission, Authorization & Procedures	Abolition or simplification (Study of the examples laid down in the countries under market economy)
Policy Planning	Holding a seminar, training in the foreign countries and acquisition of ability in planning
Administration	Cut in the items for administration, systemization of administration and introduction of format
Guidance & Direction	Preparation of guidelines, acquisition of knowledge and holding a seminar.
Information	Collection of the knowledge about the countries under market economy, information sharing and disclosure of information
Education of Human Resources	Improvement in language (English) skill, acquisition of IT skill and training in the foreign countries

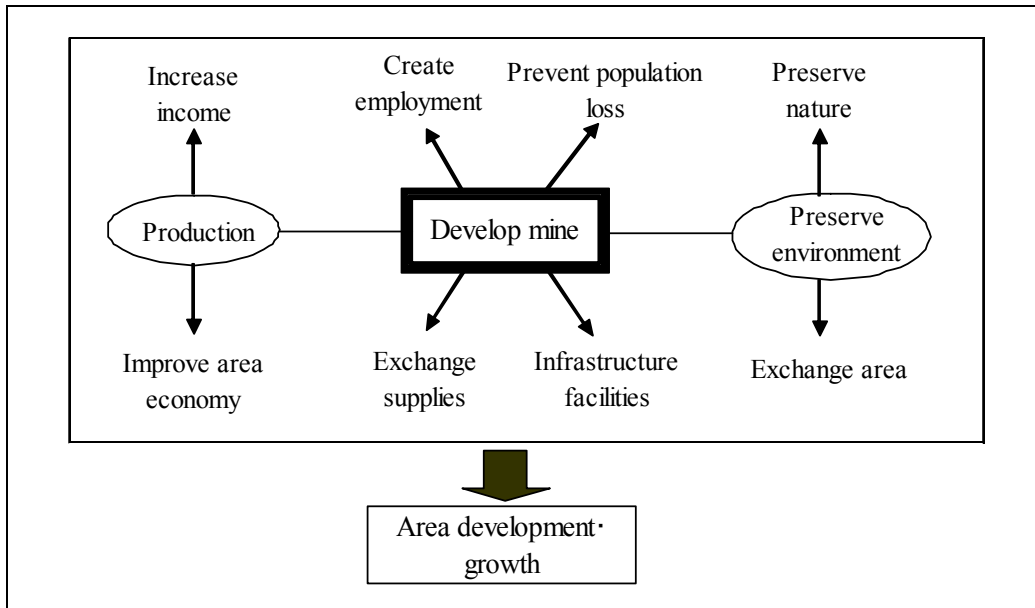
#### **2-4 National Profit and Strategy**

Under the support and guidance by an international organization with the progress of market economy in the country, Georgia has pushed forward privatization, and adjustment and revision of the legal/taxation systems. To meet a shortage of funds and the structural reforms in society and industry, Georgia is currently working hard to introduce the global standards and a variety of relevant systems from Europe and America into the country. Advancing the reforms without destroying the matured culture accumulated through the history of Georgia to date contributes to the national profit of the country. Verification over the merit/demerit on privatization through an introduction of foreign capital will produce, correction of the distortion produced through an introduction of the systems from Europe and America (the taxation, for example), etc. are the major important tasks, which the government should evaluate henceforth. To combine the promotion of mining industry with the national profit, it will be required to map out the effective strategy based on the study and evaluation over such tasks.

- **Verification over the merit/demerit of the privatization through an introduction of foreign capital, and recognition of the demerit.**
- **Grasp and correction of the distortion produced through an introduction of the systems from Europe and America.**
- **Planning a strategy attaching importance to the national profit.**

#### **2-5 Community Development**

Mining is the industry closely connected with the local community. One of the policies the government of Georgia has been pursuing is the development of local community. To promote the mining industry, it is essential to develop and maintain an amicable relationship with the local community. To keep such relationship, the environmental protection in the local community has to be realized. The harmonious relationship between the environmental preservation and the production activities is important for a sound development of the local community. Development of deposits and mining production is to develop a local society. Therefore to develop a mine is prevention for the decreasing population in the community, the employment opportunity created for the local citizens in the community, distribution of commodities increased and thus, the local society will be developed (Fig. 5.4).



**Fig. 5.4 Relationship between Development of Deposits and the Local Community**

### **3. Achievement of Guideline**

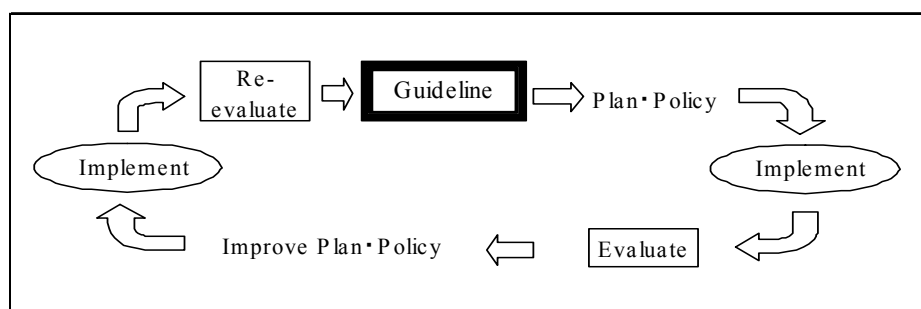
#### **3-1 Guideline**

The guideline in value given in the master plan has been laid down based on the characteristics of the resources, the ore reserve held and the mining industry basement in Georgia. In preparing the guideline, the background showing the capability as the mining country in the former Soviet Union has also been taken into consideration. Mining industry is the industry to produce international commodities and the one to play a leading role in moving and advancing to the market economy. The guideline figures of production are shown by both the quantity of production after 15 years and the macro-economic index. The guidelines in each stage are shown by the quantity of production. The specific numerical guideline has to be recognized with common in each level in the mining industry sector. While the state companies operating, the government organization must instruct the target of the mine and the one for exploration and development. The implementation of the policy to achieve the guideline is also the crucial role the governmental organization. The government organization should promote the mining industry along the guideline until companies are able to grow independently with raising domestic capital.



### 3-2 Check and Action for Implementation of Policy

To promote mining industry, it is first of all necessary to draw up the policy and plan. And then, the system for practicing the management for the guideline has to be built up by reviewing the state of implementation periodically, extracting the points in problem on the implementation of policy, and then, by amending or improving the policy (Fig. 5.5).



**Fig. 5.5 Verification for Management of the Direction for the Guideline**

## 4. Strategy for Economic Development

### 4-1 Improvement in the National Finance

It is indispensable for Georgia to improve both the macro-economy and the national finance for the promotion of the mining industry. The government has since independence been working hard to push forward the economic reconstruction positively, to control over the parameter in the macro-economy, to make efforts to increase the revenue and to cut the expenditure and thus, to implement the economic policy with these transactions. Due to the increase in its liabilities from the international organizations to reconstruct the state, its economy is however displaying the vicious cycle to repay the debts by another debts and the national economy is still in the unfavorable position to expect an improvement. Due to both the people's and the corporation's indifference in the sense toward tax payment, an increase in the tax burden with the introduction of taxation system from Europe, the inadequate system to control the tax collection and transparency in tax collection, the revenue is still in the position not to increase properly. These are also the major factors to cause expansion of the illegal economy. As the money market still fails to be built up to a full extent, the industries are still in the hard position to be cultivated and grow to a full extent. There is no measure to expect an immediate effect other than pushing forward the ones surely step by step such as simplification of the procedures for tax payment, reduction in the tax rate,

selective raising of the national industries on a priority basis and building up the money market.

**Table 5-2 Comments on improvement of the finances**

Items	Measures for Improvement
Issue of External Bond	Viable when the parameter in the macro-economy is improved, but it takes a long time to complete.
Issue of National Bonds (Mid- & Long-Term)	Stability of the politics. the trust of the government. legalization of money and issue of the bonds.
Stock Exchange	Fixation of IAS, transparency of the corporate finances and absorption of money in the black market.
Mid- & Long-Term Loan by Bank	Fix trust of the banks. the saving or depositing system with merit. a study on the object of mortgage.
Procedures on Tax Payment	A thoroughgoing execution of withholding tax. simplification of the taxation system.
Reduction in Tax Rate	Improvement in the administration system for tax collection. reduction in VAT rate.
Raising of Industries	Drawing up the policy and support for selective raising of the industries based on a priority.

#### **4-2 Reform of Consciousness and Internationalization**

The framework of the market economy has already been introduced into the country, where the activities under the economy has been penetrating. However, with the penetration, the level in the life of people is not necessarily improved yet. This is thought to be because the guidelines and restrictions followed under the market economy and business ethics as to the economic activities are not yet understood completely. Furthermore, although competitiveness, quality, efficiency and rationalization are inevitably required under the economy based on market principle such as price or market mechanism, such principle is not fully rooted yet in the country. The consciousness of the economy under the era of the socialist regime still remains in the country. Therefore, through economic activity, such consciousness has to be reformed to manage the market economy. To expedite the reform, it is important that the relevant knowledge and information on the business activity in the foreign countries under the market economy be absorbed in through the media, Internet and business seminar. Taking the population into account, Georgia needs the strategy to seek out the market abroad. Georgia is geographically located best and there exist quite a lot of potential markets in the immediate vicinity. Promoting the economic development through internationalization will definitely serve improvement in the life of the people.

- **Rooting the framework of the market economy and reform in the consciousness.**
- **Reducing the black market on the basis of business ethics and the guideline for the economic activity.**
- **Promoting internationalization and developing the market in the countries and areas in the vicinity.**

#### **4-3 Real Usage and Spreading of IAS**

“Trust” is of great importance for company. How to gain trust is directly linked as a serious matter to the company. Accounting is a system for showing the real condition of the company to a third party. It is also a system of securing transparency of the company. Also it is a method of measuring the strength of a company. The company must make a strategy and move to implementation based on “accounting standard” which is used as a measurement. The accounting standard is the so-called business society rule.

With the progress of internationalization, IAS has become a unified standard. Mining industry activity is also an industry that if the activity does not accompany borderless activity, continuous development is difficult. It is needed to obtain the trust from the international market for the introduction of foreign capital. The government organizations and mining industry companies need to tackle promotion of the mining industry with the common recognition that the usage and spread of IAS is very important for economic development.

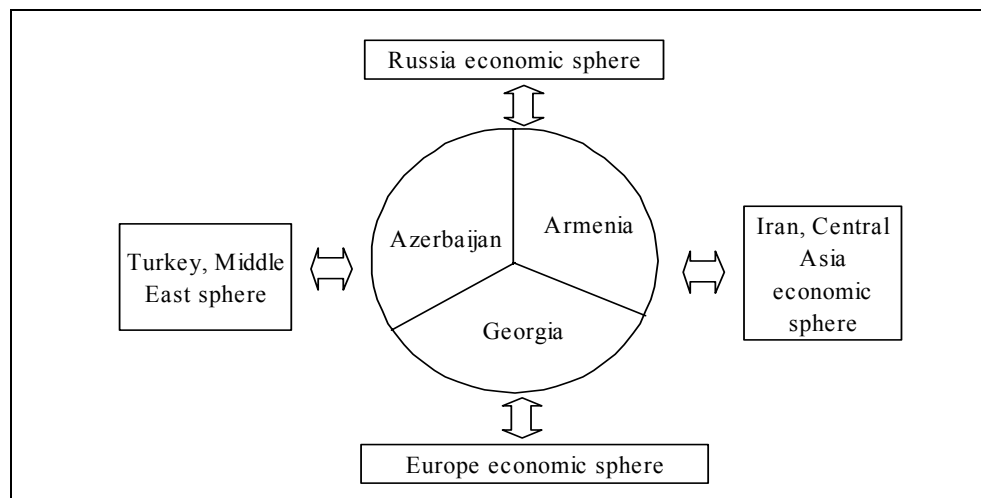
#### **4-4 Cooperation with the Neighboring Countries**

The three Caucasus nations consisting of Azerbaijan, Armenia and Georgia comprise totally a population of 16 million, which enables in size to build up the regional economic bloc. Georgia should take into account the cooperation with those neighboring countries through the economic and business activity. To aim at formation of the Caucasus regional economic bloc with independent from the subordinate Caucasus for the USSR in the era of the former Soviet Union, Georgia should build up its economic role to be performed based on its framework and the reciprocal arrangement for making the best use of the resources and industries in each country. A trade fair of Caucasus by JETRO held on 2001 in Japan could be positioned as the first step toward formation of such economic bloc. For realizing the joint economic activity, the joint industrial complex for two countries (Azerbaijan and Georgia for example) may be developed to locate in the area adjacent to the border between two countries, and be used as a supply base for materials and commodities to the regional economic bloc. In addition to such scheme, the joint development of mining and technology by the countries will serve as one of the ways for building up the economic bloc (Table 5-3).

It will also be needed the mechanism, which the Caucasus regional economic bloc can be linked to the great-sphere economic bloc expanding in the vicinity (Fig. 5-6). By European Union (EU), the scheme of a system for transportation with the support is currently under way to be built up and the preparation and improvement of related infrastructure have already started to be made for these economic blocs.

**Table 5-3 Field of mining industry and cooperation with the neighboring countries**

Items	Measures for Improvement
Technology R&D Center	Education and training for human resources, and technology development by using the devices and facilities of Tbilisi Technical University.
Joint Exploration	Exploration of copper and gold ores in the area adjacent to the border (Georgia and Armenia).
Joint R&D	Joint development of the mine by the companies of two countries.
Smelting & Manufacturing	Allotment of the roles in charge in smelting (Armenia takes charge of copper) and allotment of the roles in the metal processing.
Caucasus Mining Industry Association	The Association plays the role as the traction force in promoting the mining industry in the three countries concerned through collection of the information and its analysis.



**Fig. 5.6 Relationship of Caucasus Economic Area with Surrounding Area**

## 5. Mutual Relationship between Measures for Promotion

### 5-1 Recognition over the mutual relationship

The measures for promotion are mutually related and are systematically combined together for the effect in realizing the program, it is important to recognize that the measures are mutually related and are influential each other (Fig. 5-7). Therefore the measures should be implemented by working out a breakdown of the drafted measures and by examining the mutual relation with the other measures. For example, rooting the IAS is indispensable to the privatization, the introduction of foreign capital, the improvement in management, the promotion of the exploration and development, and the improvement in the financial condition. In relation to rooting and using the IAS, the disclosure of information is also the measure for promotion to be a premise for realizing the privatization, the introduction of foreign capital, the promotion of the exploration and development, and the environmental countermeasures.

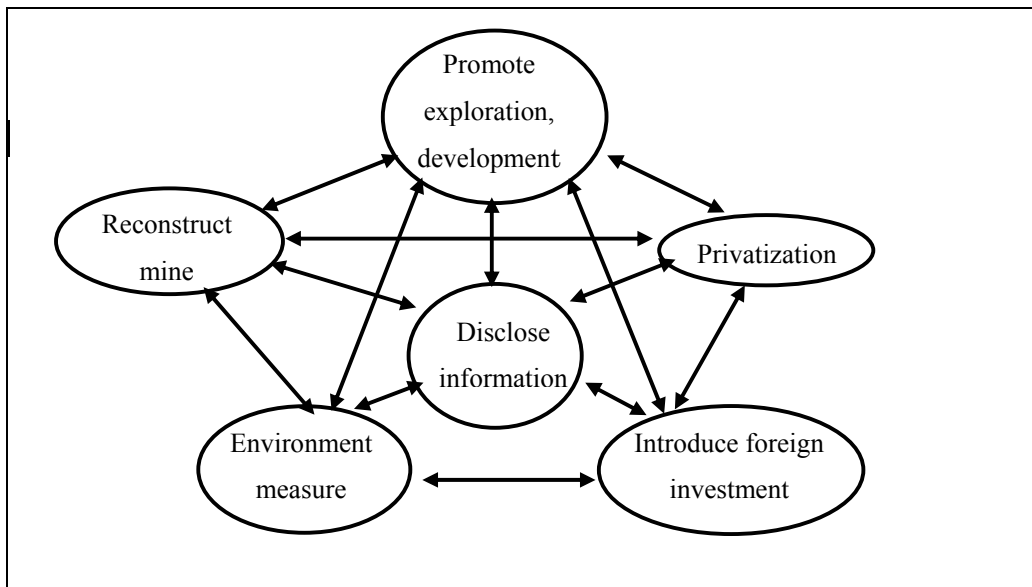
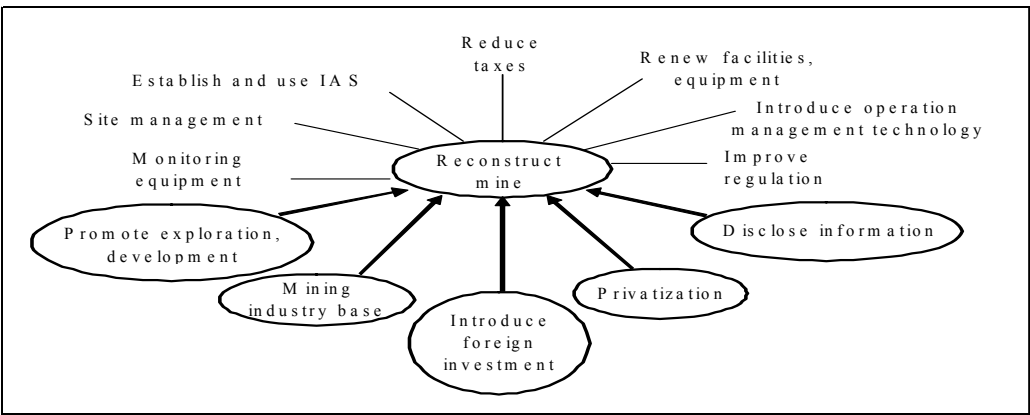


Fig. 5-7 Mutual relationship between the measures for promotion

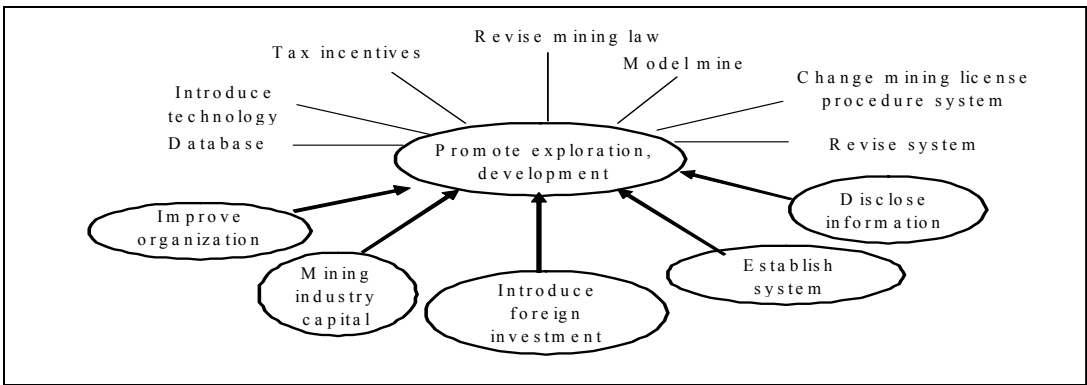
### 5-2 Mutual relationship between the measures for promotion

The concrete measures to be taken to reconstruct a mine is related to the reduction in taxation, rooting the IAS, the management system of environment, installation of

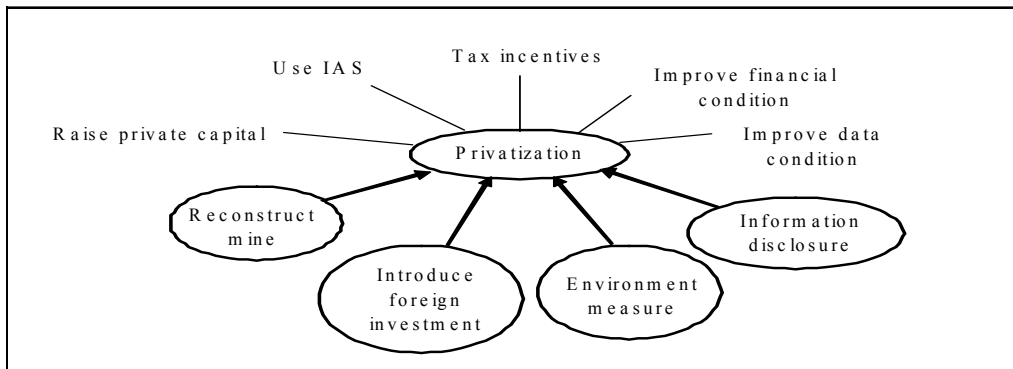
monitoring equipment, the mining fund, management over the mining business, and introduction of technologies. Moreover, measure of promotion of foreign capital, privatization is related to them. The measure promotion of exploration and development is also related to the measures mentioned above (Fig. 5-8). The measures in promoting the exploration and development link to promote by having a relationship of various measures associated (Fig. 5-9). In the privatization, such measures as not only the improvement of the conditions for a tender and the financial condition by IAS but also the tax incentive privilege, etc. is needed to be taken for execution. The role the mining fund should perform is of great importance in the operations and helps to link for raising domestic capital (Fig. 5-10).



**Fig. 5-8 Promoting measures for reconstructing a mine**



**Fig. 5-9 Promoting measure for exploration and development**



**Fig. 5-10 Promoting measure for privatization**

An introduction of foreign capital is as the object such as exploration, development and mining project and smelting business. In the privatization, improvement of the conditions for a tender and disclosure of information are mutually related, while in promotion of exploration and development, simplification of the procedures for investment and guarantee of investment are also related mutually. Disclosure of the information is also in association with rooting the IAS for use, improvement in management, the data on geology and exploration, tender and the environmental management, while the countermeasures for environment is in one with the activities for exploration, development and production.

In addition, it will be difficult for Georgia to realize these measures without a reform with the functional operation of the mining organization in the government. Georgia government has to reconstruct mining organization related to mining industry by unification, etc. to function efficiently in the operation of mining industry. The mining sectors in the government organization must draw up and implement suitable mining policy by grasping the mining activities as a whole based on unification. However even though the government under the current organization try to realize the measures on the single basis, and if the government organization must not control the mining activity, this will not lead to the overall promotion in the mining industry.

### **5-3 Realization of the Measures by its Own Efforts**

Georgia is currently still on the way for moving to the market economy, is with insufficient information and knowledge on the countries under the market economy and thus, is under the shortage of fund, too. Therefore it will be difficult for Georgia to realize the measures for promotion only by its own power. The support from the international organizations and

the countries is indispensable for Georgia to develop mining industry. Fundamentally, the government of Georgia and the mining organization in the government are first of all required to position promotion of the mining industry as the most important issue with a top priority. The measures that can be taken by its own power such as a reform in the mining organization, disclosure of the information, planning of the mining policy, etc. has to be pushed forward on the basis of the mutual relationship between the measures for promotion. The leadership of the mining organization is needed for the above mentioned.

#### **5-4 Creation of one package project of the measures for promotion**

In organizing a project, it is quite effective to combine several measures as a package project. It is needed to require the funds to realize the project with making a request to the international organizations for support to the project. As the project comes large in scale to require a huge amount of money on the loan basis, however, the government has to position the package project as the project with a top with comparison of other projects under study within the Georgian Government for the loan from the international organizations. It is thought, the project for improvement and construction of the basement for mining industry as a concrete example. This is the project prepared by combining the construction of the database, and the plan for utilization of it, moreover the administration over the mining environment and the improvement of geological map.



**Table 5-4 Package-Type Project**

**Project for Improvement & Arrangement of the Basement for Mining Industry**

Object: This project is to arrange and improve the data on the environment and geology to become the basement for promoting the mining industry. The arranged data can be utilized effectively to serve the mining activity. In addition, the project is to build up the system for the environmental administration and at the same time, to improve the basement of the environment for mining industry.

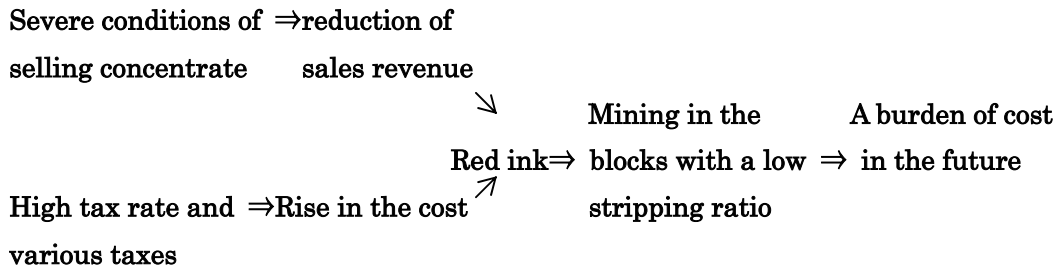
Program	Description	Costs
Data Base	Building up the database by assembling and arranging the existing data. The data cover geology, ore deposit, ore reserve, geophysical exploration, geochemical exploration, environment, properties of water (ground water, surface water)	5
GIS System	Arrangement of maps, etc. linked to database. Infrastructure, topography, surface water, ground water, hydrogeology, ore deposit, geology.	2
Arrangement & Improvement of Mining Environment	Survey over the base line of the resources potential area. The monitoring facility in the area for mining activity and resources potential area, on-line system for the data, analyzing laboratory.	10
Revision of Geologic Map	Preparation of a new geological map by reviewing the existing geologic map and surveying the geology in the site partially.	10
Effective Utilization of GIS & Data Base	Preparation of the program for utilization serving the national profit by using the GIS and database strategically and effectively.	3

Totaling US\$30 million with the term of 5 years.

**6. Significance of economical evaluation**

In this survey, the pre-feasibility study of Madneuli Mine have been carried out. As a result, the selling conditions for concentrate and the tax burden have emerged through the study as the points at issue of the mine. These points have turned out to be causing the deterioration in the operations of the mine. The payment of high tax at the stage, which the system for the

market economy has not been fully built up yet, has produced the result of having been delayed in meeting the market economy. With regard to the sales, the severe selling conditions on comparison with concentrate of the international standard condition has brought about the hard operations in the management of the mine. As a result, the mining has been carried out mostly in the blocks with a low stripping ratio to seek a reduction in the immediate cost. Such operations have produced cause for forcing burden in the cost in the future.



The economical evaluation like a pre-feasibility study makes a clear for the direction and way for improvement and concrete points for problems for improvement in the operations and the profitability. Taking greater importance of the nation with the long-term viewpoint, the current taxation without attention to the reality will be improbable to appear. There will be yet room for consideration in the selling conditions for concentrate, too. Therefore Georgian Government needs to promote the mining industry positively to be competitive enough under the market economy by penetrating the know-how and knowledge on such a method for economical evaluation.

## 7. From Promotion of Mining Industry to Sustainable Development

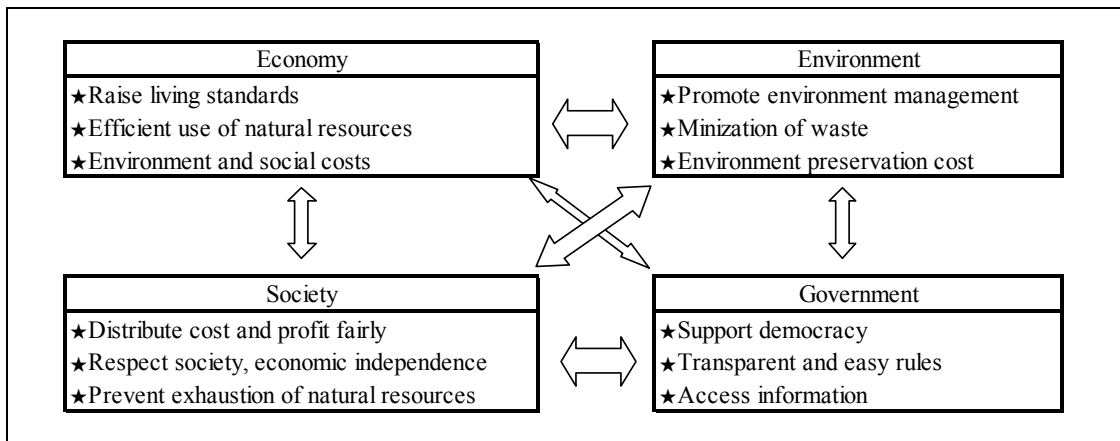
### 7-1 Sustainable Development

“Sustainable Development” is the consensus of the international society. In the mining field, the Mining, Mineral and Sustainable Development (MMSD) project through the World Business Council for Sustainable Development (WBCSD) and International Institute for Environment and Development (IIED) has surveyed and studied for two years and their report was issued in May 2002. The MMSD report covered mineral, metal, exploration, production, usage, re-usage, re-cycling and final destruction. This report provides an efficient framework to the mining industry field for sustainable development including these broad fields.

- Comprehensive economic activity accompanied with efficient government system, social problems, and environmental protection  $\Rightarrow$  “sustainable development”

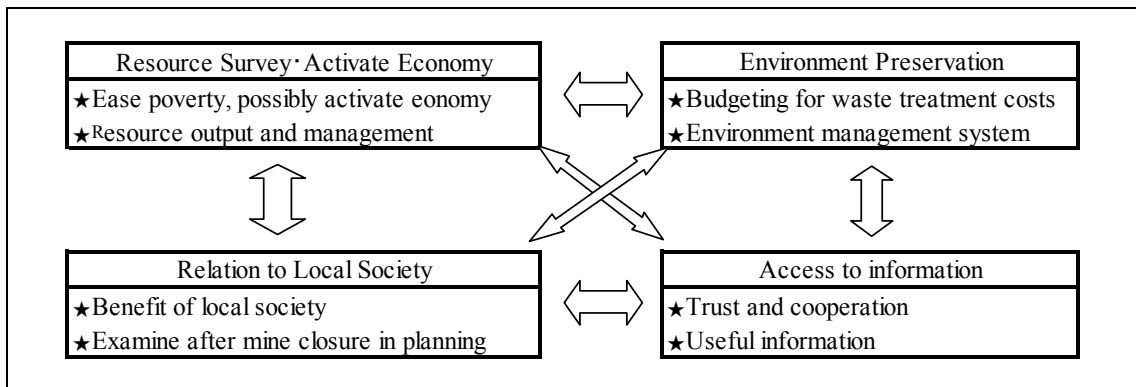
- Make cost reduction, make fair distribution of profit and, make stable condition for present generation, and make confirmation on the possibility of development for the next generation.  $\Rightarrow$  establish short- and long-term targets.
- Respect for rights and interest.
- Understanding of challenge and restriction.
- Public organization for thorough conformity to suitable standards.
- Scale with proven possibility for improvement and evaluation of progress.

These are basic concepts and each item is inter-related. Improvement by checking progress with the plan and long-term targets is the base. It is needed to advance development with understanding of standards and restrictions (Fig. 5-11).



**Figure 5-11 Base Concept of Sustainable Development**

There are many subjects in the mining industry field for realizing “sustainable development” with these basic concepts. The main subjects are the role of resource development, tackling the environment subject, relation with the local society, value for information, etc. To tackle these subjects link to the promotion of the mining industry and development (Fig. 5-12).



**Fig. 5-12 Principle Subjects of Sustainable Development**

There are important subjects, which should reform the present condition for “sustainable development”. The impact will be given for tackling the above-mentioned main subjects if these reforms are not carried out.

- Who is to pay for the loss of heritage regarding to problems such as pollution and site destruction? How will money be raised?
- If the basic recognition for the mineral resource potential contribution to the national economy is lacking, the mining industry activity is not linked to fair usage and easing poverty.
- Group correspondence like the creation of good results by companies of all sizes is needed. It is needed to live in mutual peace and prosperity.
- Organizations like the Mining Association can provide group correspondence to local society and government organizations.

MMSD drew up four steps for realization of sustainable development, namely these steps are to construct an understanding of sustainable development, to make a management system, to establish a corporation relationship in relation to the advantages and disadvantages and to establish the ability of treatment for effective activity (Table 5.5). Georgia mining industry must attempt to promote reconstruction of mines and promotion of exploration and development in the near future. However in realization of this Master Plan, the Georgia government should study the MMSD report for sustainable development and should tackle to use the framework of sustainable development.

**Table 5-5 Outline of Sustainable Promotion Method (MMSD)**

Step	Subject	Contents
1	Understanding of sustainable development	Enter curriculum for mine engineer education.
		Understand related to government organization, mine manager
		Engineer, researcher understand relation between their activity and this problem.
2	Make rule at organization level and management system	Make rule for sustainable development for each organization
		Company makes a management system for this subject (It I linked to low cost and efficiency)
3	Cooperation on advantage and disadvantage of mutual relation	Build a network of the group, organization
		Communication based on individual, make adjustment
4	Construction of management ability for efficient activity	Make relations with local society from survey stage
		Implement survey of environment and society from start of project
		Make contribution plan for local society around mine
		Review law, improve transparency of information disclosure by government

## **7-2 Correspondence to Globalization**

Globalization requires severe competition with international liberalization and decreasing metal prices in the mining field. Many countries have opened their market in the mining industry field and they have attempted the introduction of foreign capital. Multinational companies (majors), have accelerated large-scale production and scaling up of machines, equipment, etc. by investment to develop large-scale deposits and large-scale mines. Super large-scale mines producing over 500,000 tons per year of copper metal basis are in operation in Chile and Indonesia. Solvent extraction electrowinning (SX-EX method), which produces metal directly from ore, has a 20% share of copper metal production in the world. The production cost is 20% lower compared to the usual method, which produces concentrate from ore and copper from smelting concentrate. It has become highly competitive with its low cost. Large capacity equipment, machines, etc., and large-scale production need huge amounts of investment. Therefore the competitiveness of small-medium scale mining companies, which have little capital will drop more. Recently, copper concentrate production is shown around 60% share by the top ten producers. The majors' production ratio has an increasing tendency.

Like this trend of the mining industry by globalization, the Georgia government should study how to correspond to this trend. It is an important subject that Georgia knows how to survive, which has not high potential for a large-scale deposit to exist because of having mostly small-medium mines and deposits. The Georgia government emphasizes dependence on foreign investment. However, it is needed to recognize that foreign capital can withdraw if their profitability becomes low and they are unprofitable. Although Georgia must have a condition for the introduction of foreign capital because of a money shortage, it should be realized its mining industry with a target for the construction of a mining industry basement by raising domestic capital and by domestic capital. Needless to say, emphasizing competitiveness by the smelting business in an area of cheap freight, reciprocal relationships among the three countries in the Caucasus, quality control, development of high-grade deposit and systemization, etc. should be needed. Moreover, it should be thought to seek mining activity in an area by the construction of a Caucasus economic block.

## **7-3 Promotion of Development for Small-medium Deposits**

Most small-medium scale mining industry companies in the world have carried a role for development as the core of the local economy by becoming deeply rooted in the local society. The above-mentioned globalization gives a big impact to the local society by the reduction of small-medium scale mining industry and caused them to close. In the case of Georgia,

Madneuli Mine, etc. has the same situation even though Madneuli Mine has been recovering its production.

In Georgia still now, domestic capital is not raised. Promotion of the mining industry will be difficult if government does not support by promotion measure such as mining fund and model mine for exploration and development with self-sufficiency of domestic capital. Development of the mining industry and local society will be linked if development of small-medium scale deposits with competitiveness and production activity has been carried out. If the government does not construct the basement for the promotion of exploration and development for small-medium scale deposits based on the promotion measures proposed by this Master Plan, resources will not produce economic value.

#### **7-4 Information Disclosure and Use of Web Site**

The fund and subsidy for the mining industry promotion should be used with a limited term and limited usage, which was mentioned in this Master Plan already. It is indispensable to secure transparency for having an efficient functional subsidy. It is needed to make a consensus of the nation about the understanding the administration of the subsidy, its procedure and limit to a target by information disclosure. Mineral resource use tax is thought to be one of the sources for the mining fund. However there is a possibility that the reduction of tax revenue by incentive privilege of the tax system could produce fear to accelerate more reductions of tax revenue. Development of industries including the mining industry and protection of the environment should be in harmony. Presently the development of industry is positioned with the importance of the environment in the trend of the great importance placed on environmental protection in the whole world. Therefore it is needed to study that the source of the fund for the mining fund is from the environment tax, but it is important for securing transparency for this fund. Establishing of a fund is difficult without making a consensus of the nation.

Disclosure is a principle for the realization of subsidy and fund. It is desirable to use the web site, which was constructed by this survey as a place for information disclosure. Now the web site has been made in English. However, it is important and useful as a place for making a consensus of the nation by making the site in the Georgian language.