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付 属 資 料

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付属資料 1:各国へ提出した質問票

October 21, 2013

**Project Name: Data Collection and Confirmation Study on the Mine Environment
and Safety in the African Area**

QUESTIONNAIRE ON THE MINE ENVIRONMENT AND SAFETY

Please kindly reply to questions and fill out following items and tables correctly and completely.
We would appreciate if you could respond by November 1, 2013.

Name of Country: _____

PERSON (S) TO BE COMPLETING THE QUESTIONNAIRE

(1) Office - 1

Date Completed	
Name	
Title	
Name of Office and Department	
Address of Office	
Phone No.	
Fax No.	
E-mail Address	

(2) Office - 2

Date Completed	
Name	
Title	
Name of Office and Department	
Address of Office	
Phone No.	
Fax No.	
E-mail Address	

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I. Policy Related to the Mining Industry

I-1. Policy of the Mine Environment to the Obligated and Unobligated Mines

Q-1.1: Does your office/department supervise generally on the mining industry?

● Answer: ☐Yes ☐No

Q-1.2: Have the law on Environmental Impact Assessment (EIA) been established in your country?

● Answer: ☐Yes ☐No

Q-1.3: Is the EIA included items related to the mining activities; namely mineral exploration, mine development, mine operation, mine closure and after closed mine?

● Answer: ☐Yes ☐No

Q-1.4: Does your office/department inspect and/or manage the procedure of the EIA related to the mining industry?

● Answer: ☐Yes ☐No

● Commenced year of the EIA works: Year _____

Q-1.5: What kind of the environmental items are the EIA contained basically?

● Answer: Environmental items for the EIA;

* Natural environment (e.g.: Topography, geology, flora and fauna, etc.)

1) _____, 2) _____, 3) _____, 4) _____

5) _____, 6) _____, 7) _____, 8) _____

* Social environment (e.g.: Community, traffic, resettlement, etc.)

1) _____, 2) _____, 3) _____, 4) _____

5) _____, 6) _____, 7) _____, 8) _____

* Living environment (e.g.: Air quality, water contamination, etc.)

1) _____, 2) _____, 3) _____, 4) _____

5) _____, 6) _____, 7) _____, 8) _____

Q-1.6: Are the environmental permissions by your department/office necessary before the implementation of countermeasures against the mining pollution, mine closure plan, etc.?

● Answer: ☐Yes ☐No

● Commenced year of the permission works: Year _____

If no, which department/office does the permission works take in charge?

● Department/office in charge: _____

● Commenced year of the permission works: Year _____

Q-1.7: What kind of permissions does your department/office conduct as usual?

● Answer: Items of permission: 1) _____, 2) _____,
3) _____, 4) _____

Q-1.8: Does your department/office take in charge concerning the management after mine closure?

● Answer: ☐Yes ☐No

● Commenced year of the mine management works: Year _____

Q-1.9: Does the monitoring plan as a part of management of mining industry implement during the mine operation or after mine closure?

● Answer: ☐Yes ☐No

Q-1.10: What kind of items does the monitoring works contain?

* Natural environment (e.g.: Topography, water, flora and fauna, etc.)

1) _____, 2) _____, 3) _____, 4) _____

* Social environment (e.g.: Traffic, resettlement, local economy, safety, etc.)

1) _____, 2) _____, 3) _____, 4) _____

* Living environment (e.g.: Air quality, water contamination, noise, etc.)

1) _____, 2) _____, 3) _____, 4) _____

Q-1.11: Please describe the administrative activities and incidents occurred in the past concerning the management as mine environment as much as possible.

1) _____, Year/month: ____/____

2) _____, Year/month: ____/____

3) _____, Year/month: ____/____

4) _____, Year/month: ____/____

5) Others.

Q-1.12: What are your recent main targets of mine environmental policy in your country?

- Answer: 1) _____,
2) _____,
3) _____,
4) _____.

I-2. Policy of the Mine Safety to the Obligated Mines

Q-1.13: Are there laws, relevant laws and regulations related to the mine safety in your country?

● Answer: ☐Yes ☐No

If yes, please write down those names as well as established year.

1) Name: _____, Year: ____

2) Name: _____, Year: ____

3) Name: _____, Year: ____

4) Others.

Q-1.14: Please write down the summary of laws and regulations listed above (as same numbers).

1) Law/Regulation-1: _____

2) Law/Regulation-2: _____

3) Law/Regulation-3: _____

4) Others.

Q-1.15: Is there technical guidelines or manuals for the mine safety and practical counter-measures of mine safety?

● Answer: ☐Yes ☐No

If yes, please write down the names of technical guidelines as well as established year.

And please provide the copy of those information for the mine safety.

(Please hand them to us when we visit your office during this project.)

1) Guideline-1: Name: _____, Year: ____

2) Guideline-2: Name: _____, Year: ____

- 3) Guideline-3: Name: _____, Year: _____
4) Others.

Q-1.16: Please write down the summary of technical guidelines listed above (as same numbers).

- 1) Guideline-1: _____

2) Guideline-2: _____

3) Guideline-3: _____

4) Others.

Q-1.17: Are there the practical mining methods and/or guidelines concerning the protection of mineral resources as a mine safety?

● Answer: ☐Yes ☐No

If yes, please write down the names of mining methods and/or technical guidelines as well as established year.

- 1) Mining method-1: Name: _____, Year: _____
2) Mining method-2: Name: _____, Year: _____
3) Mining method-3: Name: _____, Year: _____
4) Guideline-1: Name: _____, Year: _____
5) Guideline-2: Name: _____, Year: _____
6) Guideline-3: Name: _____, Year: _____
7) Others.

Q-1.18: Please write down the summary of mining methods and/or technical guidelines listed above (as same numbers).

- 1) Mining method-1: Summary: _____

2) Mining method-1: Summary: _____

3) Mining method-1: Summary: _____

4) Guideline-1: Summary: _____

5) Guideline-2: Summary: _____

6) Guideline-3: Summary: _____

7) Others.

Q-1.19: Were there practical countermeasures against the mine pollutions in the past?

● Answer: ☐Yes ☐No

If yes, please write down the names of mine, location and countermeasures implemented as well as year to be occurred. And please provide the location map for mine pollution to be occurred.

- 1) Mine: _____, Location: _____, Year: _____
2) Mine: _____, Location: _____, Year: _____
3) Mine: _____, Location: _____, Year: _____
4) Mine: _____, Location: _____, Year: _____
5) Mine: _____, Location: _____, Year: _____

6) Mine: _____, Location: _____, Year: _____
7) Others.

Q-1.20: Please write down the summary of measures against the mine pollutions listed above (as same numbers).

- 1) Case-1: _____
- 2) Case-2: _____
- 3) Case-3: _____
- 4) Case-4: _____
- 5) Case-5: _____
- 6) Case-6: _____
- 7) Others.

Q-1.21: Please describe the administrative activities and incidents in the past concerning the management as mine safety as much as possible.

- 1) _____, Year/month: ____/____
- 2) _____, Year/month: ____/____
- 3) _____, Year/month: ____/____
- 4) _____, Year/month: ____/____
- 5) Others.

Q-1.22: Please write down the summary of measures against the mine pollutions listed above (as same numbers).

- 1) Mine pollution-1: _____
- 2) Mine pollution-2: _____
- 3) Mine pollution-3: _____
- 4) Mine pollution-4: _____
- 5) Others.

Q-1.23: What are your recent main targets of mine safety policy in your country?

- Answer: 1) _____,
- 2) _____,
- 3) _____,
- 4) _____.

II. Legal System Related to the Mining Industry

II-1. Legal System on the Mine Environment and Mine Safety to the Obligated and

Unobligated Mines

Q-2.1: Have the Mining Law and/or Mine Safety Law been already instituted as a basic law?

- Mining Law

Answer: ☐Yes ☐No

If yes, please write down those names as well as established year, and please provide the copy of law instituted.

1) Name: _____, Year: _____, Final revised year: _____

- Mine Safety Law

Answer: ☐Yes ☐No

If yes, please write down those names as well as established year, and please provide the copy of law instituted.

1) Name: _____, Year: _____, Final revised year: _____

Q-2.2: Are there other relevant legislations related to the mine safety?

- Regulation related to the mine safety

Answer: ☐Yes ☐No

If yes, please write down those names as well as established year, and please provide the copy of regulation instituted.

1) Name: _____, Year: _____, Final revised year: _____

2) Name: _____, Year: _____, Final revised year: _____

- Ministerial Orders concerning the mine safety

Answer: ☐Yes ☐No

If yes, please write down those names as well as established year, and please provide the copy of order instituted.

1) Name: _____, Year: _____, Final revised year: _____

2) Name: _____, Year: _____, Final revised year: _____

Q-2.3: Have the following relevant laws/regulations already instituted in your country?

- | | |
|---|--|
| • Environmental Impact Assessment (EIA) Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Air Pollution Control Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Water Contamination Control Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Soil Contamination Control Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Noise Pollution Control Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Mine Closure Management Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Waste Management Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Laws related to the Water | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Environmental (Basic) Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • River Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Landslide Protection Law | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Environmental Standard for Air Quality | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| • Environmental Standard for Water Quality | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No |

- Environmental Standard for Groundwater Quality Answer: ☐Yes ☐No
- Environmental Standard for Noise Answer: ☐Yes ☐No
- Environmental Standard for Drinking Water Answer: ☐Yes ☐No

If yes, please provide the copy of laws/regulations instituted.

Q-2.4: Are there other relevant laws, regulations, ministerial orders, etc.

● Answer: ☐Yes ☐No

If yes, please write down those names as well as established year, and please provide the copy of order instituted.

1) Name: _____, Year: _____, Main content: _____

III. Administrative System Related to the Mining Industry

III-1. Administrative System on the Mine Environment to the Obligated and Unobligated

Mines

Q-3.1: Please write down the administrative organization related to the mine environment, and please fill up the following items and attach a drawing of the administrative organization chart.

- Competent authorities : 1)_____, 2)_____
- Name of department : 1)_____, 2)_____
- Number of staff : 1)_____, 2)_____

Q-3.2: Is there the management flow related to the mine environment?

- Answer: ☐Yes ☐No

If yes, please provide the copy of drawings.

Q-3.3: Is your department/office concerned to manage evaluation of the EIA concerning the mine environment?

- Answer: ☐Yes ☐No

If yes, please fill up the following questions and provide the management organization and the procedure of evaluation of the EIA.

- Competent authorities : 1)_____, 2)_____
- Name of department : 1)_____, 2)_____
- Number of staff : 1)_____, 2)_____

If no, which department/office is mainly concerned to manage evaluation of the EIA for mining activity? Please fill up the following questions and provide the management organization and the procedure of evaluation of the EIA.

- Competent authorities : _____
- Name of department : _____
- Number of staff : _____
- Relation with your department/office: _____

Q-3.4: Has the monitoring system for the mine environment been established in your department/office?

- Answer: ☐Yes ☐No

Q-3.5: If the answer of Q-3.4 is no, please inform us the actual executive department/office implementing the monitoring works for the mine environment.

- Answer: _____

Q-3.6: If the answer of Q-3.4 is yes, please fill up the following questions and provide the management organization chart of monitoring system.

- Competent executive section in your department/office : _____
- Name of department managed : _____
- Number of staff : _____

Q-3.7: Does your department/office get aids from the international organization, etc. on the mine environment at present and/or in the past?

●Answer: ☐Yes ☐No

If yes, please fill up the following questions.

- Content of aids: _____
- Aid giving organizations: 1) _____, 2) _____
- History of those aids on this matter: _____

Q-3.8: Does your department/office get a bilateral aid on the mine environment at present and/or in the past?

●Answer: ☐Yes ☐No

If yes, please fill up the following questions.

- Content of bilateral aid: _____
- Aid giving countries: 1) _____, 2) _____, 3) _____
- History of bilateral aid: _____

Q-3.9: Does your department/office expect capacity development and personnel training related to the mine environment to JICA (Japan International Agency) for promoting a sustainable mine development?

●Answer: ☐Yes ☐No

If yes, please fill up the following questions.

- What kind of technical cooperation related to the mine environment does your department/office expect to JICA at this moment?:
 - 1) Item-1: _____
 - 2) Item-2: _____
 - 3) Item-3: _____
 - 4) Item-4: _____
 - 5) Others. _____

III-2. Administrative System on the Mine Safety to the Obligated Mines

Q-3.10: Please write down the administrative organization related to the mine safety, and please fill up the following items and attach a drawing of the administrative organization chart.

- Competent authorities : 1)_____ and 2)_____
- Name of department : 1)_____ and 2)_____
- Number of staff: 1)_____ and 2)_____

Q-3.11: Is there the management flow related to the mine safety?

●Answer: ☐Yes ☐No

If yes, please provide the copy of drawings.

Q-3.12: Is your department/office concerned to manage evaluation of the EIA concerning the mine safety?

●Answer: ☐Yes ☐No

If yes, please fill up the following questions and provide the management organization and the procedure of evaluation of the EIA.

- Competent authorities : 1) _____, 2) _____
- Name of department : 1) _____, 2) _____
- Number of staff: 1) _____, 2) _____

If no, which department/office is mainly concerned to manage evaluation of the EIA concerning the mine safety? Please fill up the following questions and provide the management organization chart and the procedure of evaluation of the EIA.

- Competent authorities : _____
- Name of department : _____
- Number of staff: _____
- Relation with your department/office: _____

Q-3.13: Has the monitoring system for the mine safety been established in your department/office?

- Answer: ☐ Yes ☐ No

Q-3.14: If the answer of Q-3.12 is no, please inform us the actual executive department/office implementing the monitoring works on the mine safety.

- Answer: _____

Q-3.15: If the answer of Q-3.12 is yes, please fill up the following questions and provide the management organization chart of monitoring system for the mine safety.

- Competent executive section in your department/office : _____
- Name of department managed : _____
- Number of staff: _____

Q-3.16: Does your department/office get aids from the international organization, etc. on the mine safety at present and/or in the past?

- Answer: ☐ Yes ☐ No

If yes, please fill up the following questions.

- Content of aids: _____
- Aid giving organizations: 1) _____, 2) _____
- History of those aids on this matter: _____

Q-3.17: Does your department/office get a bilateral aid on the mine safety at present and in the past?

- Answer: ☐ Yes ☐ No

If yes, please fill up the following questions.

- Content of bilateral aid: _____
- Aid giving countries: 1) _____, 2) _____, 3) _____
- History of bilateral aid: _____

Q-3.18: Does your department/office expect capacity development and personnel training related to the mine safety to JICA (Japan International Agency) for promoting a sustainable mine safety?

- Answer: ☐ Yes ☐ No

If yes, please fill up the following questions.

- What kind of technical cooperation related to the mine safety does your department/office expect to JICA at this moment?: _____

- 1) Items-1: _____
- 2) Items-2: _____
- 3) Items-3: _____
- 4) Others.

IV. Mining Condition

IV-1. Mining and Mine Safety Condition of the Operating Mines

Q-4.1: Please list up all of active (operating) mines in your country at present and please fill out the following table, and please provide location map of each mine.

If you currently have electric files and/or reports of those data mentioned, please provide and attach them with this answer.

Table 1 List of Operating Mines

(1) Basic information

No.	Name	Location	Name of company	Kind of minerals*1	Remarks
1)					
2)					
3)					
4)					
5)					
6)					
7)					
8)					
-					

*1 ☐ Base metals: _____, ☐ Rare metals: _____, ☐ Precious metals: _____,

☐ Iron ores: _____, ☐ Non-metals: _____, ☐ Coal: _____

(2) Details of mining condition

No.	year of Commenced	Acquisition year of EIA	Operating period	Area of mine development	Number of workers	Mining method	Mining volume		Dressing method*3
							t/d*1	t/y*2	
1)				ha	psn		t	t	
2)				ha	psn		t	t	
3)				ha	psn		t	t	
4)				ha	psn		t	t	
5)				ha	psn		t	t	
6)				ha	psn		t	t	
7)				ha	psn		t	t	
8)				ha	psn		t	t	
-				ha	psn		t	t	

*1 day, *2 year, *3 Mineral dressing method of each mineral

(3) Environmental condition, etc.

No.	Volume of water used	Volume of discharge	Waste (rock) dump area*1			Tailings dam		
			Volume	Area	Management*2	Volume	Area	Management*2
1)	m ³ /d	m ³ /d	m ³	ha	yes/no	m ³	ha	yes/no
2)	m ³ /d	m ³ /d	m ³	ha	yes/no	m ³	ha	yes/no
3)	m ³ /d	m ³ /d	m ³	ha	yes/no	m ³	ha	yes/no
4)	m ³ /d	m ³ /d	m ³	ha	yes/no	m ³	ha	yes/no
5)	m ³ /d	m ³ /d	m ³	ha	yes/no	m ³	ha	yes/no
6)	m ³ /d	m ³ /d	m ³	ha	yes/no	m ³	ha	yes/no
7)	m ³ /d	m ³ /d	m ³	ha	yes/no	m ³	ha	yes/no
8)	m ³ /d	m ³ /d	m ³	ha	yes/no	m ³	ha	yes/no
-	m ³ /d	m ³ /d	m ³	ha	yes/no	m ³	ha	yes/no

*1 Present condition, *2 Confirmation of implementation of environmental management

V. Mine Environment

V-1. Environmental Issues Related to the Mine Activity

Q-5.1: Are there mine pollution, apprehensive phenomena, problems and potentials related to the mine environment in your country (according your definition of the classification of mine environmental issues)?

●Answer: ☐Yes ☐No

If yes, please list up all of environmental issues mentioned above and please fill out the following table, and then please provide location map of each case.

And then, if you currently have electric files and/or reports of those data mentioned, please provide and attach them with this answer.

Table 2 List of Apprehensive Environmental Issues at Mining Sites in the Country

No.	Name of mine	Location	Obligating mine / unobligated mine*1	Environmental issues				Remarks
				Air	Water	Soil	Others	
1)								
2)								
3)								
4)								
5)								
6)								
7)								
8)								
-								

*1 Unobligated closed mine

Please describe below concerning the definition or temporally classification of mine environmental issues, e.g. mine pollution, environmental problems, environmental potential, apprehensive phenomena, etc.

(Definition of mine environmental issues)

- 1) Items-1: _____
- 2) Items-2: _____
- 3) Items-3: _____
- 4) Items-3: _____
- 5) Others. _____

Q-5.2: How is the environmental cares and/or countermeasures for those apprehensive mine sites listed in Table 2? Please fill out the following table on the environmental investigation, environmental countermeasures and monitoring for each mine site (as same numbers).

If you currently have electric files and/or reports of those data mentioned, please provide and attach them with this answer.

Table 3 Environmental Condition of Each Apprehensive Mine Sites

No.	Environmental survey			Environmental countermeasures			Monitoring*2				
	Yes/ No*1	Content of survey	Results	Yes/ No*1	Content of measures	Results	Air	Water	Soil	Others	Results
1)											
2)											
3)											
4)											
5)											
6)											
7)											

8)												
-												

*1 Was the environmental survey implemented in the site? : Yes / No

*2 If the monitoring works are not implemented, please mark “-” in each column.

Q-5.3: Have the information and data of polluted mine sites such as listed in Table 2 and 3 been disclosed to public?

● Answer: ☐Yes ☐No

Q-5.4: How about the damages due to the mine pollution at present or in the past?

● Answer: ☐Yes ☐No

If yes, please fill up the following questions.

● Number of cases of damage: _____ cases

● Condition of damages: 1) _____, 2) _____, 3) _____

Q-5.5: How about the awareness of local residents concerning the mine pollutions mentioned above?

● Degree of awareness: ☐High ☐Middle ☐Low

V-2. Environmental Potentials of Mine Pollution

Q-5.6: Are there environmental potentials occurring mine pollutions in your country?

● Potentials: ☐Yes ☐No

Q-5.7: How are those potentials of environmental issues?

● Content of those potentials: _____

Q-5.8: Where are those potentials likely occurred?

● Inferred sites: 1) _____, 2) _____, 3) _____, others

Q-5.9: Are the monitoring works for environmental investigation around the potential sites?

● Monitoring: ☐Yes ☐No

● Content of monitoring: _____

● Results of monitoring: _____

Q-5.10: How is the affected condition due to the occurrence of those mine pollutions?

● Case-1: _____

● Case-2: _____

● Case-3: _____

● Others.

Q-5.11: How is the affecting area due to the occurrence of those mine pollutions (as same numbers)?

● Case-1: Inferred area: _____ ha

● Case-2: Inferred area: _____ ha

● Case-3: Inferred area: _____ ha

● Others.

- Q-5.12: How about the probability of occurrence of mine pollutions mentioned above?
- Degree of probability: ☐High ☐Middle ☐Low

V-3. Countermeasures to the Environmental Issues Related to the Mines by the Central and Local Governments

- Q-5.13: Are there political measures against the mine pollution and/or potential of environmental issues?
- Political measures: ☐Yes ☐No
- Q-5.14: Are there political measures by local government level against the mine pollution and/or potential of environmental issues?
- Political measures by local governments: ☐Yes ☐No

VI. Mine Safety

VI-1. Working Safety for Miners in Operating Mines

Q-6.1: Are there apprehensive phenomena, problems, etc. related to the mine safety in your country?

● Answer: ☐ Yes ☐ No

Q-6.2: Please list up all of mine safety issues mentioned above and please fill out the following table.

If you currently have electric files and/or reports of those data mentioned, please provide and attach them with this answer.

Table 4 List of Apprehensive Mine Safety Issues in the Country

No.	Apprehensive phenomena	Location	Content of mine safety	Main causes	Countermeasures implemented		
					Yes/No	Content	Results
1)							
2)							
3)							
4)							
5)							
6)							
7)							
8)							
-							

Q-6.3: How about the occurrence of practical damages due to the mine safety?

● Damages: ☐ Yes ☐ No

● Number of people damaged: Death _____psn, Injured _____psn

● Content of those damages: _____

Q-6.4: Have the information and data of damaged due to mine safety such as listed in Table 4 been disclosed to public?

● Disclosure: ☐ Yes ☐ No

VI-2. Protection of the Natural Resources

Q-6.5: Are there mining sites to be illegally or unreasonable mined out mineral resources in your country?

● Answer: ☐ Yes ☐ No

Q-6.6: How about the content of the answer of Q-6.5?

● Content of illegally or unreasonable mining: ☐ Random mining, ☐ Illegal mining outside of mining claim, ☐ Grave robbing, ☐ Others

Q-6.7: How about the mining accidents in the mining sites?

● Content of mining accidents: ☐ Collapse of surface, ☐ Cave-in, ☐ Spontaneous combustion, ☐ Flooding, ☐ Others

VI-3. Safety of the Mine Facilities

Q-6.8: Are there standards related to the construction for mine facilities?

● Standards for construction: ☐ Yes ☐ No

Q-6.9: How are those standards of construction?

- Kind of standards: ☐Construction standard • Guideline, ☐ Standard for Construction structure, ☐ Standard for civil engineer, ☐ Others

Q-6.10: Is there item of ground stability in those standards as mentioned above (Q-6.8 and 9)?

- Answer: ☐Yes ☐No
- Content: ☐ Slope stability, ☐ Landslide and slope protection, ☐ Others

Q-6.11: Is there standard and/or guideline concerning the gunpowder using in the mine site?

- Standard: ☐Yes ☐No
- Guideline: ☐Yes ☐No

Q-6.12: How about the standard and/or guideline of the gunpowder?

- Answer: ☐ Gunpowder law, ☐ Others
- Guideline: ☐Yes ☐No

Q-6.13: Are there apprehensive cases related to the mine safety at present?

- Apprehensive cases: ☐Yes ☐No
- Content of those cases: ☐ Terror, ☐ Riot, ☐ Criminal offense, ☐ Others

End of Questions,

Thank you very much for your kind cooperation.

JICA Study Team

JICA (Japan International Cooperation Agency)

付属資料 2: 各国セミナー用資料(その 1)

JICA Activities for Mining Sectors

Seminar 1

JICA Study Team

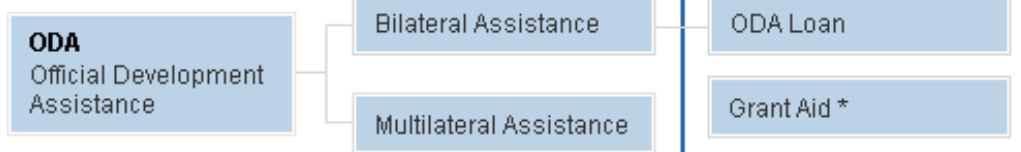


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JICA Overview



- Around 100 offices in the world and 34 offices in Africa
- JICA provides Technical cooperation, ODA loan and Grant aid among the Japanese ODA scheme



*This excludes Grant Aid which the Ministry of Foreign Affairs will continue to directly implement for the necessity of diplomatic policy.

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JICA Strategy in Mining Sector

Strategic Targets are

- (1) Investment Climate and Infrastructure Development
- (2) Human Resource Development

And consider the actual risks



Source: Ernst & Young, Business risks facing mining and metals 2012 - 2013

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JICA Strategy in Mining Sector



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JICA Strategy in Mining Sector

I

Infrastructure and Regional Development

- Developing infrastructure; electricity, water and transportation
- Developing communities around mines
- Regional promotion, and measures for closing or closed mines, etc.

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JICA Strategy in Mining Sector

II

Policy Support and Legal System Development

- Formulating mining sector master plan
- Organizing the laws and regulations related to mining exploration development, etc.
- **Human resource development**

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JICA Strategy in Mining Sector

III

Mineral Resource Management

- Better estimation by advanced technology
- Establishing appropriate management systems, etc.
- **Human resource development**

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JICA Strategy in Mining Sector

IV

Mine Safety and Environmental Measures for Mines

- Improving technology for mine pollution prevention and environmental restoration
- Organizing the law related to mine safety
- **Human resource development**

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JICA Activities in African Region

Aid for upgradings of studies and projects

Country	Project name	Duration	Scheme
ANGOLA	Capacity Building of Institute of Geology (IGEO) of ANGOLA	2012-2013	Expert/Training
MALAWI	Project for Establishment of Integrated Geographic Information System (GIS) Database for Mineral Resources	2011-2013	Development Study
ZAMBIA	Capacity Building in GIS Database Management	2010-2011	Expert
MALAWI	Senior Volunteer	2008-2011	Volunteer
MADAGASCAR	Geological mapping and mineral information system project for promotion of mining industry	2008-2011	Development Study
ZAMBIA	Geological Mapping and Mineral Information Service Project for Promotion of Mining Industry	2007-2010	Development Study
MAURITANIA	Strategic Plan Survey of Mineral Resources	2003-2005	Development Study
MOROCCO	Upgrading Exploration Technology of Mineral Resources	1998-2002	Technical Cooperation Project
ZAMBIA	A Pre-Feasibility Study for the Phosphate Development Project	1984-1985	Development Study
UGANDA	The Rehabilitation Study of Kilembe Mines and Jinja Smelter Plant	1980-1981	Development Study
TANZANIA	Pre-Feasibility Study on Natural Soda Development in Lake Natron Related Transportation Facilities	1975-1976	Development Study

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JICA Activities in African Region

Cooperative exploration projects

Country	Exploration area	Duration	Target Metals
MALI	Bougouni, Kekoro-Baoule-Banifing area	1991-1993, 1994, 1997-1999, 2000-2003, 2000-2001	Gold
MALAWI	Chilwa Alkaline area	1986-1988, 1989	Rare Earth
MADAGASCAR	Southern area	1991-1993	Gold, Silver, Copper
BOTSWANA	Northeastern area	1979-1982	Copper, Chromium
NIGER	Liptako, Sirba area	1989-1991, 1992-1994, 1995	Gold
NAMIBIA	Orange and Kalkfeld, Otavi mountainland area	1993-1994, 1995-1997	Rare Earth, Niobium, Phosphorus, Iron, Lead, Zinc
TANZANIA	Southern Lake Victoria area	1995	Gold
ZIMBABWE	Shamva, Kadoma, Macdougall, Makonde, Snake Head area	1983-1985, 1986-1988, 1989-1991, 1992-1994, 1995-1997	Gold, Copper Nickel
ZAMBIA	Karenda, Chambishi southeast, Kabwe, Kabwe west area	1984-1986, 1987, 1989-1990, 1993-1995	Copper Cobalt, Lead, Zinc
DEMOCRATIC REPUBLIC OF THE CONGO	Southern Shaba area	1971	Copper
Kenya	Kerio valley, Homa Bay, Mombasa area	1983-1985, 1987-1989, 1990-1992, 1993	Chromium, Rare Earth, Zinc

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We are looking at Southern Africa intensely



- Japanese government held a special symposium for the sustainable mining in African Region, 2013.
- The sessions divide into the mineral resource development and mining technologies including **the mine environment and safety**
- Related ministers were participated from the region.

*Japan **SU**stainable **M**ining, **I**ntestment & **T**echnology business forum 2013*

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Next activities by JICA for African mining sectors

- JICA is preparing following projects for the sustainable mining
- Enhancing human resource development
- Enhancing mine environment and safety
⇒ *This Study is corresponded to this action and Human resource development as well*

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Enhancing human resource development

- **Postgraduate level training in Japan**

⇒ JICA has scheme to postgraduate level educations for government officers and public servants of African countries



JICA-Akita University Partnership for the education of mining

- **Education and research in Africa**

⇒ JICA has scheme to the assistance of mining schools and universities in Africa for upgrading local human resources and enhancing research activities

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African *Business Education Initiative* for Youth (*ABE Initiative*)

ABE Initiative will be launched and included

- **Maser's degree program** in Japanese universities and **Internship program** in Japanese enterprises
- Invite 1,000 African youth to Japan during 5 years from 2014
- Many areas and vocations from the age 22 to 39



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Enhancing mine environment and safety

- JICA commenced this study for enhancing the mine environment and safety
- Series of related information will be gathered through this study from the region



•JICA will consider and prepare the next Japanese ODA project in respect to this field
•Technical cooperation will be followed in several sites needed for the improvement after above

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JICA commenced this study as a help for sustainable mining in Africa Region

Thank You



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付属資料 3: 各国セミナー用資料(その 2)

Data Collection and Confirmation Study on the Mine Environment and Safety in the African Area



Seminar 2

JICA Study Team



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1



1. Outline of the Study

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2



1.1 Objectives of the Study

Data collection and compilation for

- Mine Environment
- Mine Safety
- Needs of Technical Assistance



1.2 Study Area



0 1,000 km

 Objective Countries



1.3 Content of the Study

Period: October/2013 – March/2014 (6 months)

Content of the Study:

- 1) Preparation works in Japan
- 2) **First site investigation (This visit)**
- 3) Analysis works in Japan
- 4) Second site investigation
- 5) Compilation works in Japan



1.4 Study Schedule

Work Items	2013			2014		
	October	November	December	January	February	March
Preparation Work in Japan						
Data collection and compilation						
Sending of questionnaire						
Preparation work of Seminar						
First Site Investigation						
Group - 1						
Group - 2						
Analysis Work in Japan						
Analysis of answers of questionnaire						
Submission of Interim Report						
Second Site Investigation						
Visiting mine pollution sites						
Compilation Work in Japan						
Evaluation of results of site visit						
Submission of Draft Final Report						
Seminar in Japan						
Submission of Final Report						



1.5 First Site Investigation

: Data collection and Interview Survey

- a) Mining policy
- b) Type and number of mines and environmental condition
- c) Type and condition of mine environmental issues
- d) Type and condition of mine safety issues
- e) Requests of each countries especially needs of cooperation assistance



1.6 Second Site Investigation

(Present condition at mine sites polluted.)

- * Detail survey at mine sites polluted:
 - 1) Clarification of environmental issues
 - 2) Examination of mine pollution control
 - 3) Sampling soil and mine water
 - 4) Summary survey: scale, type, etc. of polluted mine area



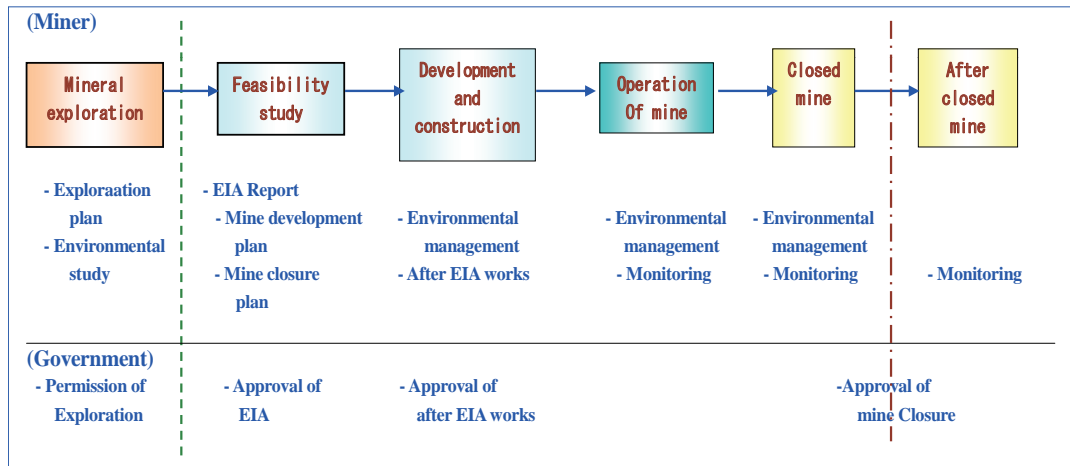
2. Keynotes of the Study



Technical Keynote of the Study

- 1) To promote the mine development
respecting for the environmental and social
consideration
- 2) To clarify the role between operating and
closed mines
- 3) To apply the mine pollution control
techniques through experiences in Japan

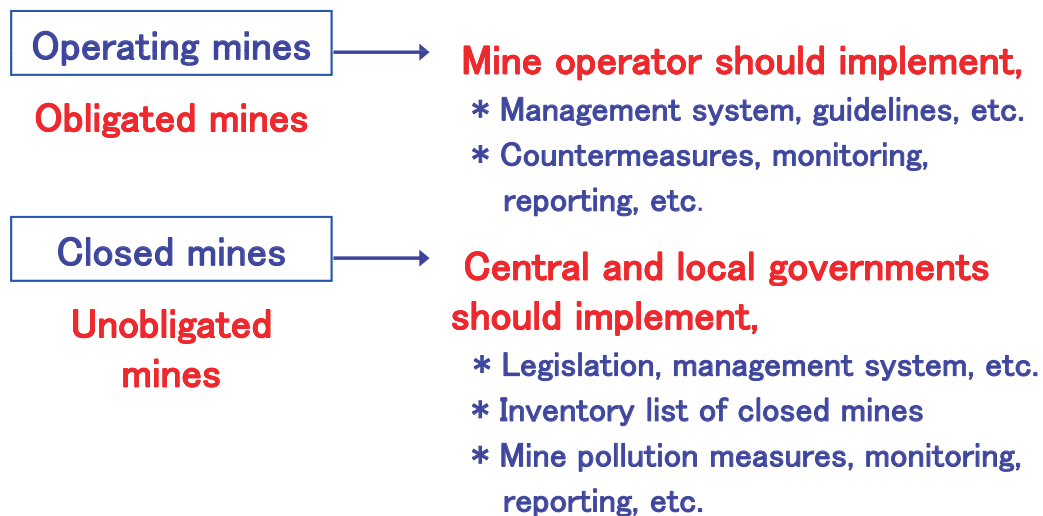
1) To promote mine development respecting for the environmental and social consideration



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2) To apply role between operating and closed mines



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12



3) To apply the mine pollution control techniques through experiences in Japan

For details, please refer to Seminar 3



3. Requests form your Country for the mine environment and mine safety

* Study includes to put your requests for the capacity development and personnel training (long term training)

The technical fields are,

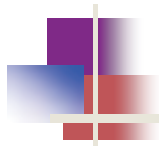
- 1) Mine safety and environmental measures
- 2) Mineral resources management
- 3) Legislation related to the mining and strategy for mining development
- 4) Infrastructure and regional development, etc.

**Our Study Team would like to hear
your requests and/or catch your
information in respect to the mine
environment and safety**



Thank you

付属資料 4: 各国セミナー用資料(その 3)



For the Sustainable Mining

Seminar 3

JICA Study Team



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Data Collection and Confirmation Study on the Mine Environment and Safety in the African Area, 2013*

Common concerns in mining activities

- **Exploration Stage**
Land use, administration, agreement, etc....
- **Mining and Production Stage**
Employment, local community, pollution to outward, management, etc....
- **Close or Abandon Stage**
Rehabilitation, closed plan, etc....



**Considerations of above concerns are necessary
for the sustainable mining**

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Actual concerns in the most operating mine

are focused on

- Pollution to outward and internal
- Employee's safety
- Understanding from resident involved
- etc.....

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Case of management for the mine pollution in Japan

Agenda

- History of metal mining
- History of the mining pollution
- Current situation and cases to manage the pollution in Japan
- Brief overview of mine safety
- Conclusion for the sustainable mining

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History of metal mining in Japan

- **BC 2c**, Bronze Bell was produced
- **AD674**, Silver was mined (Tsushima Mine)
- **703**, Copper was mined (Osarizawa Mine)
- **749**, Gold was mined (Mutsu area)
 - Many small scale mines were operated during this era -
- **1467**, Mining was begun as an economic source of Samurai
- **1870's - 1960**, **Modernistic minig** was begun and Cu, Au and Pb-Zn were mined on the large scale
- **1970's**, **Resource price and reserves were degraded** and mines were begun to close



Great image of buddha (AD752)



Ashio Cu Mine had the world class Cu production at the time

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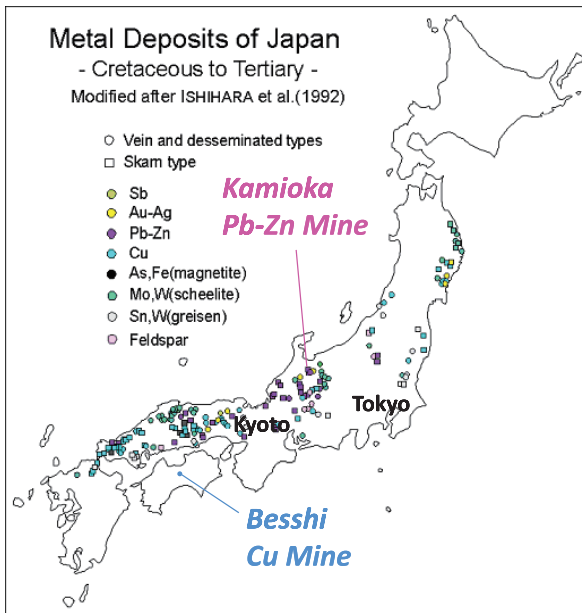
Japan was an Mineral Resource Country

- **Copper** : Japanese production, mainly from Ashio Mine and Besshi Mine, was reached **roughly 5% in the world 1890's to 1950's** , the production reached **second during 1910's**
- **Gold** : Sado Mine produced **top class in the world during 1600's**
- **Silver** : Iwami Mine was reached **third part of the world in beginning of 1700's**
- **Sulfur** : Matsuo Mine was reached **top in the Asia before 1960's**

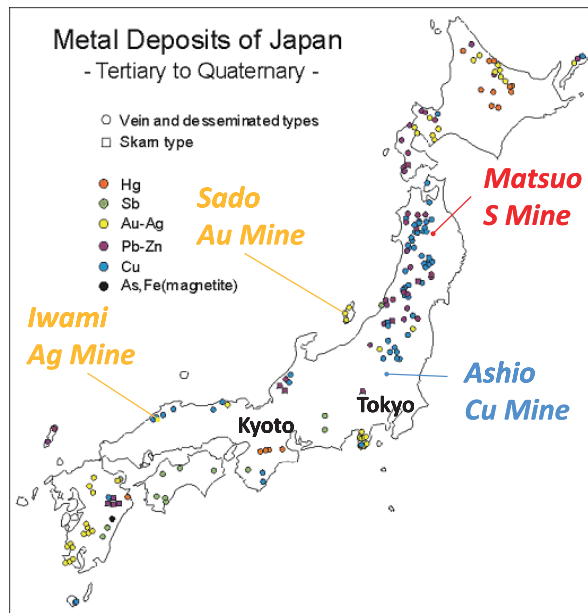


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Metal mines in Japan (Most mines were closed)



Data are from AIST



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History of mine pollution in Japan

- **1700's**, **Mine pollutions** were begun to occur
- **1880's**, **Modernistic minig** was begun and Cu and Au were mined on the large scale
- **1884**, **Ashio Cu Mine** pollution problem was happen
- **1893**, **Besshi Cu Mine** pollution problem was happen
- **1910 - 1970**, **Kamioka Pb-Zn Mine** pollution problem was happen and continued injuries called **"Itai Itai Desease"**
- **1933 - 1969**, **Matsuo S Mine** pollution was continued



Ashio Cu Mine was the first mine pollution problem in Japan



Mine pollution problem in Japan was begun from 1880's, which modernistic minings were commenced

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Mine Pollution in Ashio Copper Mine

- This Mine discharged of Cu mine water and exhausted SO₂ gas from the smelter



Operating stage in 1895
Air pollution by smoke from the
flue exhausted SO₂ gas and the
forest was died



Cu and Fe were deposited in
downstream through acidic mine
water

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Control of Acid Mine Drainage (AMD) in Ashio Copper Mine

- **Watarase flood control pond** was constructed by the government after the issue risen during 1910 to 1922
- The Pond is used for preventing AMD (Acid Mine Drainage) from the Mine



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Mine Pollution in Besshi Copper Mine

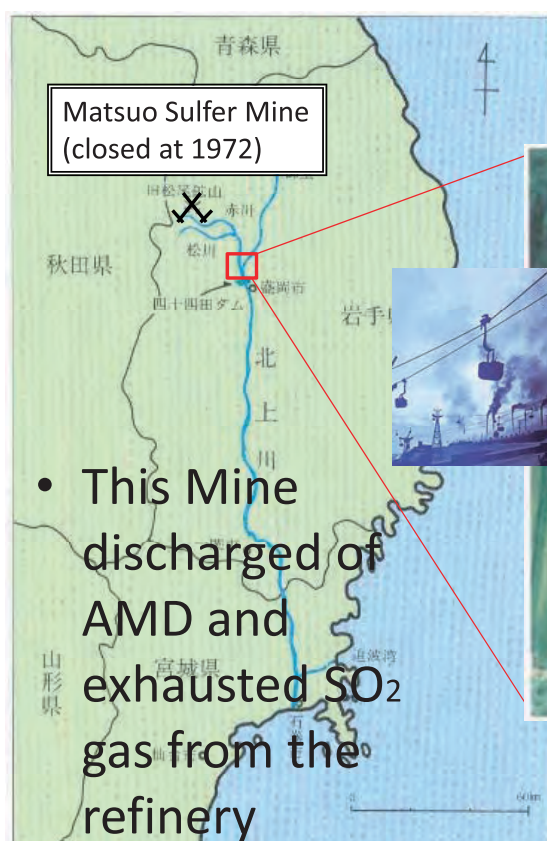
- This Mine exhausted SO₂ gas from the smelter
- The smelter was relocated and improved facilities to avoid the pollution

The smelter was relocated several times from mountain site to isolated island

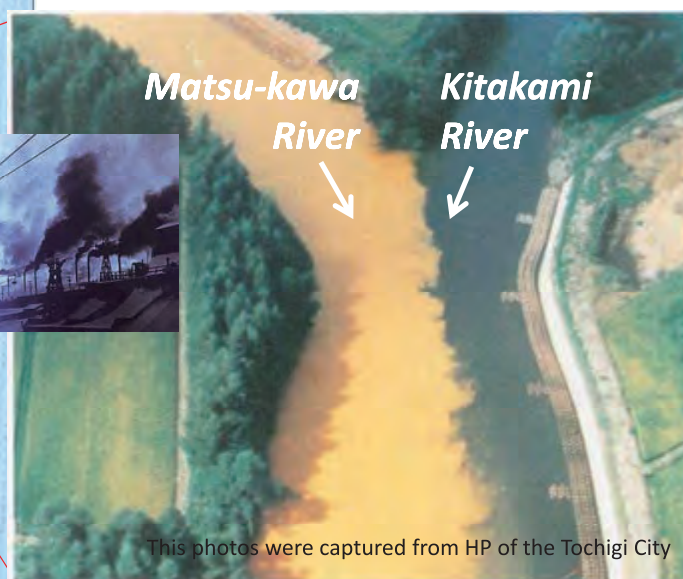


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Mine Pollution in Matsuo Sulfur Mine



- This Mine discharged of AMD and exhausted SO₂ gas from the refinery



This photos were captured from HP of the Tochigi City

Waste water situation at confluence of two rivers near the Sulfur Mine at the time of mine operation

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Management for the AMD Control in Closed Matsuo Sulfur Mine

- Mine has been controlling the AMD by JOGMEC
- Several facilities for the improvement of mine environment were constructed after the closure

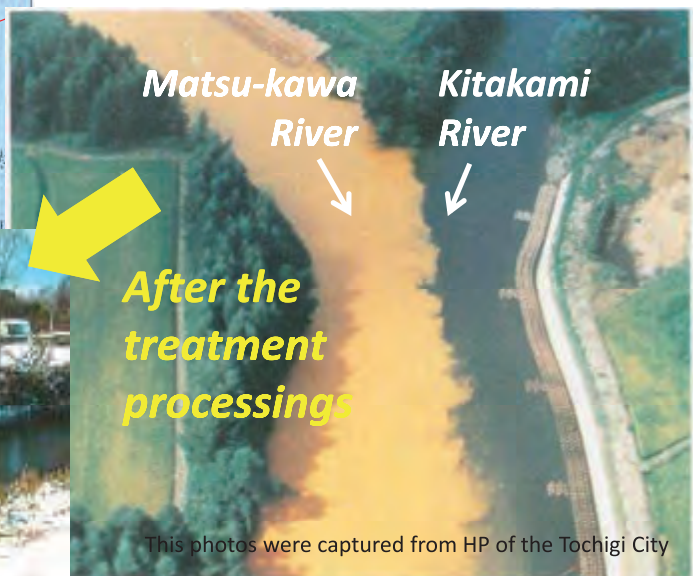


Above photos were captured from HP of the JOGMEC

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AMD was improved by the management

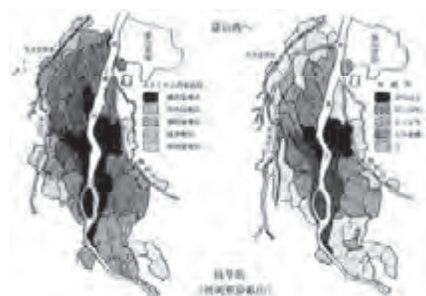


Waste water situation at confluence of two rivers near the Sulfur Mine at the time of mine operation

This photos were captured from HP of the Tochigi City
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Mine Pollution in Kamioka Lead-Zinc Mine

- This Mine outflowed of mine water including Cd from the facilities and the Cd was concentrated into the soil of the rice field in downstream



Polluted area by Cd



Kamioka Pb-Zn Mine (already closed)

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Three serious pollutions in Japan

● Minamata Disease (1956 and 1965)

⇒ **Methylmercury** was concentrated into sea water from the industrial plant

● Itai Itai Disease (1955)

⇒ **Cadmium** was concentrated into soil of the rice field from the Kamioka Mine

● Yokkaichi Asthma (1960)

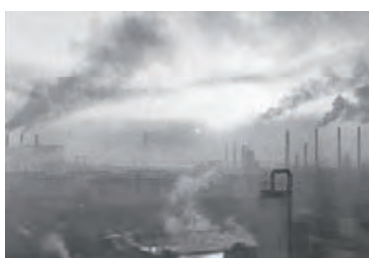
⇒ **Sulfurous acid gas** as an air pollution was flowed out to the air from the industrial plant



Minamata Disease



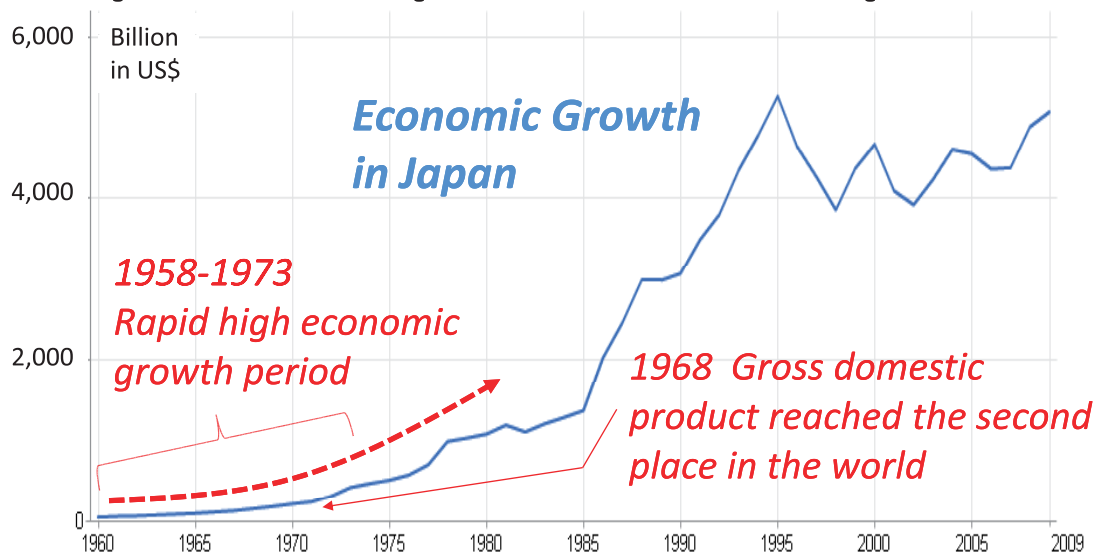
Itai Itai Disease



Air Pollution in
Yokkaichi

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How to occur fundamentally the pollution problems in Japan



➡ **Environmental pollution problem occurs under the rapid economic development**

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Regulation relevant to the environmental pollution in Japan

- **1967** Environmental Pollution Prevention Act
- **1971** Establishment of Environment Agency
- **1973** Law on Special Measures for Mine Damages caused by the metal mining industry
- **1993** Basic Environment Act
- **2001** Establishment of the Ministry of the Environment
- **2002** Soil Contamination Countermeasures Act

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