

The Government of Mongolia
Mining Sector Institutional Strengthening Technical Assistance Project
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**Final report of “Erdenes Mongol
LLC/Erdenes Tavan Tolgoi JSC Review
of the Tavan Tolgoi Environmental
and Social Management System”**



ModonKhur LLC



Tecol LLC

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Acronyms

WB	World Bank
ADB	Asian Development Bank
ERDB	European Renaissance Development Bank
FS	Fuel Station
MEGD	Ministry of Environment and Green Development
EMP	Environmental Management Plan
DEIA	Detailed Environmental Impact Assessment
EMS	Environmental Management System

CHAPTER I. ERDENES TAVAN TOLGOI PROJECT DESCRIPTION

1.1 Project Objectives:

1. Implement and reach the objective indicated in the Government Action Plan: “Renew the list of strategically important deposits such as Tavan Tolgoi’s coal deposit, Oyu Tolgoi’s copper and gold, Tumurtei’s iron ore, Tsagaan Suvraga’s copper-molybdenum, Asgat’s silver deposit and intensify the processes to put the large deposits into economic circulation”
2. Intend the Resolution No.39 on some issues for mining of the Tavan Tolgoi Deposit, passed by Parliament of Mongolia in 2010 and to improve governmental and regional economic capacities for development of the Tavan Tolgoi Deposit and ensure its sustainable development.

1.2. Project Background

In 1996, “Magma Copper” LLC obtained the exploration licenses on site and conducted some research and studies. In 1998, exploration licenses were transferred to Australian BHP LLC and to Mine Info LLC in 1999. Since 1999, Energy Resources LLC obtained the exploration licenses until mining licenses 11943A, 11953A, 11954A, 19955A, 19956A were transferred to state owned Erdenes MGL, established by the order No.817 of head of former Mineral and Oil Agency (current Mineral Resource Agency) in 28 May 2008. Moreover, Parliament of Mongolia negotiated and ratified following actions for mining of Tavan Tolgoi Deposit in 7 July 2010. Herein:

- ✓ To establish the Erdenes Tavan Tolgoi JSC (ETT), a Daughter Company of state owned “Erdenes MGL” LLC, to transfer the all mining license for Tavan Tolgoi deposit. To sell 30% of its shares in foreign stock exchange market and commence the mining operation by operating companies.
- ✓ To comply with international proposed standards for constructing and developing industrial facilities, road and infrastructure alongside the Tavan Tolgoi Deposit; to create jobs and value added export products, to prioritize consuming domestic goods, which were produced and manufactured in the country.
- ✓ To conduct negotiations and make contracts on transit transportation, prerequisites, advance payment, port utilization, investment and product sales terms, to select main contractor company (consortium) with the presence of foreign and domestic investors and to present the contract draft and submit the other related documents to the Parliament Fall Session of 2010.

1.3 Project Scope

Development of the Tavan Tolgoi Project includes construction of open pit mine with capacity of processing 15 million tonnes per annum, coal handling and preparation plant, 600MW power plant, 400 km railroad connecting Tavan Tolgoi-Tsagaan Suvraga-Zuun Bayan, water pump station with capacity of 40 thousand cubic meter, 70 km water supply pipelines, and housing for 10 000 households.

The coal handling and preparation plant, to be constructed under the project, will have capacity to produce, export and supply domestic market with 5.5 million tonnes of coking coal, 3.7 million tonnes of thermal coal, and 1 million tonnes of intermediate products.

The power plant, to be constructed at the Tavan Tolgoi Deposit has to supply all the facilities within the site with electricity and heating and is responsible for power transmission, distribution and supply. The plant will be operated with intermediate product from coal processing. The condensation power plant with capacity of 600MW will supply with electricity to mines, coal handling and preparation plant, water supply construction, housing and other facilities developed through Tavan Tolgoi coal mine and Oyu Tolgoi's copper and gold mine.

The final products of the Tavan Tolgoi Deposit will be transported to the world market via railroad connecting Tavan Tolgoi-Tsagaan Suvraga-Zuun Bayan. Furthermore, the products from Tsagaan Suvraga, Ukhaa Khudag, and Baruun Naran deposits can be transported via the railroad, which will give an opportunity to enhance its capacity.

1.4 Energy Supply

For initial 2-3 years, project required power will be supplied through diesel generator at mine site or 12 MW power plant at Ukhaa Khudag site and from third year of project, power will be supplied through 600MW coal fired power plant, that would be established within the project as indicated in the Feasibility study.

The power plant with capacity of 600MW will use intermediate product and thermal coal from the coal handling and preparation plant and main user will be the mine, coal handling and preparation plant, and other facilities, which would be constructed through Tavan Tolgoi coal mine and Oyu Tolgoi's copper and gold mine.

1.5 Water Supply

In order to mine Tavan Tolgoi deposit, an exploration work for water resource has been intensively performed since 1980s. As a result, the study was conducted with the state centralized budget money by an order from Board of Ministeries, at that time. Water from underground source located in Balgasiin Ulaan Nuur area, 70km to south-west from the deposit, is likely to be utilized for the Tavan Tolgoi mining operations.

The water source of the Balgasiin Ulaan Nuur was classified as A+B+C₁, as below, and estimated 40.1 m³/day by the joint resource commission of Mongolia and Soviet Union on 1 July 1988.

$$A=20736,0 \text{ m}^3/\text{day}$$

$$B=11491,0 \text{ m}^3/\text{day}$$

$$C_1=7949,0 \text{ m}^3/\text{day}$$

The groundwater resource exists in a manner of water strata settled or accumulated in middle and upper quaternary sediments and in particles of 50-70 m thick detritus from sedimentary origin.

The joint commission concluded that if the restoration of the groundwater resources was considered as 40.1 thousand m³ per day or 40 percent of the static resources, it could be used

for 30 years and restoration condition would not be lost.

Thus, the mines, coal handling and preparation plant, power plant, housing water supply will be provided with groundwater resources of Balgasiin Ulaan Nuur through pipelines in accordance with the planning.

CHAPTER II. ERDENES TAVAN TOLGOI PROJECT'S ENVIRONMENT

2.1 Project location, environment and climate

Tavan Tolgoi Deposit is located in Ulaan Nuur basin, Tsogttsetsii soum of Umnugobi aimag, a Southern part of Mongolia, 16 km to south west from Tsogttsetsii soum center, 90 km to east from Dalanzadgad city, 440 km from Sainshand station, 540 km from Ulaanbaatar, over 200 km from the Mongolia-China border, 150 km from the Oyu Tolgoi Deposit with 220 hectar land. It is connected with unpaved road west to Dalanzadgad and north to Ulaanbaatar.

It is divided into Tavan Tolgoi-1, Tavan Tolgoi, Bor tolgoi, Bortee-1, and Shar teeg, with concerned mining licenses 11943A, 11953A, 11954A, and 11956A in geographical location of L-48-7, 8, 19, 20, with scale of 1:100 000 in the territory of Tsogttsetsii soum.

Coordinates according to its mining licenses:

11954A

No	Longitude	Latitude	No	Longitude	Latitude
1	105°16'00"	43°43'00"	9	105°26'40"	43°39'28"
2	105°27'54"	43°43'00"	10	105°23'30"	43°39'28"
3	105°27'54"	43°41'24"	11	105°23'30"	43°38'06"
4	105°26'50"	43°41'24"	12	105°21'00"	43°38'06"
5	105°26'50"	43°39'18"	13	105°21'00"	43°35'35"
6	105°27'54"	43°39'18"	14	105°27'54"	43°35'35"
7	105°27'54"	43°38'45"	15	105°27'54"	43°33'00"
8	105°26'40"	43°38'45"	16	105°16'00"	43°33'00"

11943A

No	Longitude	Latitude
1	105°27'54"	43°38'45"
2	105°30'50"	43°38'45"
3	105°30'50"	43°35'35"
4	105°27'54"	43°35'35"
5	105°27'54"	43°35'30.15"
6	105°28'40"	43°36'30.15"
7	105°28'40"	43°37'28"

11953A

No	Longitude	Latitude
1	105°27'54"	43°43'00"
2	105°32'37"	43°43'00"
3	105°32'37"	43°42'30"
4	105°36'22"	43°42'30"
5	105°36'22"	43°43'00"
6	105°45'00"	43°43'00"
7	105°45'00"	43°39'18"

8	105°28'42"	43°37'28"
9	105°28'42"	43°37'56"
10	105°27'54"	43°37'56"

8	105°32'30"	43°39'18"
9	105°32'30"	43°41'24"
10	105°27'54"	43°41'24"

11955A

No	Longitude	Latitude
1	105°21'00"	43°38'06"
2	105°23'30"	43°38'06"
3	105°23'30"	43°39'28"
4	105°26'40"	43°39'28"
5	105°26'40"	43°38'45"
6	105°27'54"	43°38'45"
7	105°27'54"	43°35'35"
8	105°21'00"	43°35'35"

11956A

No	Longitude	Latitude
1	105°27'00"	43°39'18"
2	105°45'30"	43°39'18"
3	105°45'30"	43°33'00"
4	105°27'40"	43°33'00"
5	105°27'54"	43°35'35"
6	105°30'00"	43°35'35"
7	105°30'00"	43°38'45"
8	105°27'54"	43°38'45"

2.1.1 Climate and wildlife

Tavan Tolgoi Deposit has an extreme continental climate; wind is from east west to west. The area has dry summer and chilly winter. Average temperature over the years is 20.2°C in warm seasons, cold weather average temperature is -11.5°C, with rainfall of average of 150mm per annum and summer time rainfall is 121mm. Average humidity in cold weather is 54%, and warm weather 37%. During winter, there does not sustain snow cover and wind is calm during autumn. From February to June, it has dust storm with speed up to 28 m/s. Temperature data is shown in the Table 2.1, and 2.2.

Climate indicators

Table 2.1

Month	Average temperature, °C	Surface average temperature, °C	Average wind speed, m/s	Total sunshine hours
I	-15.2	-16.2	2.8	227.0
II	-11.7	-12.1	3.3	220.1
III	-3.2	-1.9	4.3	257.0
IV	6.1	8.4	6.5	259.2
V	13.8	18.0	5.4	314.1
VI	19.4	23.3	4.4	313.9
VII	21.3	24.7	3.9	302.8
VIII	19.2	22.5	3.5	297.4

IX	13.3	15.2	3.6	285.4
X	4.8	5.0	3.4	272.2
XI	-5.7	-6.6	3.4	229.1
XII	-13.4	-14.6	2,9	267.2
Жил	4.0	5.4	4.0	3195.4

Wind

Table 2.2

Direction	Frequency, %				Speed, m/s			
	I	IV	VII	X	I	IV	VII	X
North	5.2	9.2	11.4	6.7	4.3	5.3	4.5	4.4
North east	2.2	3.2	4.7	2.9	1.9	3.8	3.4	2.1
East	4.0	4.0	5.3	3.7	2.5	3.7	3,5	2.4
South east	6.3	8.0	12.1	7.2	3.4	4.5	4.2	2.9
East	6.4	4.9	9.5	6.8	2.2	4.6	5.1	2.9
East west	8.2	9.6	10.3	13.1	2.1	5.6	5.2	3.7
West	27.0	25.3	15.7	26.6	4.5	6.7	5.5	5.3
South west	40.7	35.8	31.0	33.0	5.4	7.4	5.5	5.6

2.1.2 Surface

Surface is dominated flat steppe with low hills and mountains. It is located 1490-1590 meters above sea level. The highest points are Baga Uul /1731.1 m/ to the southwest, Maiga Ulaan uul /1587.5 m/ to the east north, Negui Undurlug /1652.2 m/ to the straight south, and Tavan Tolgoi Uul /1570 m/ to the southeast of Tavan Tolgoi site. The lowest locations are Ulaan Nuur and other lake areas. Lake banks are sandy, filled with mud. It is classified as a gobi desert landscape due to the geographical zoning and as a hillocky plateau due to E.M.Murzaev landscape typological zoning.

2.1.3 Water

Tavan Tolgoi Deposit area does not have permanent flow of water, however temporary saline lakes are formed between mountain valleys and in depressions and water ditches in gully during plenty rainfall. Annual rainfall is approximately 150 mm and 70% of this falls from June to September. A surface water resource is located in the distance about 220 km, at Ongi River and its surface water is 6 meters depth. Main drinking water supply for local community is provided with hand and underground wells. Water spurting of the hand wells is different while their quality is bad. Whereas the groundwater quality is comparatively good.

2.1.4 Flora and fauna

The Tavan Tolgoi Deposit spreads of tawny and brown soil. For flora, the area is desert landscaping; fertile soil is around 4-6 cm thick and steppe, desert bushy plants such as caragana, salsola, oxytropis and quitch are dominated. In addition, salt marsh and broom grasses are mainly

grown in some valleys. As for wildlife and fauna, foxes, wolves, corsac foxes, rabbits, wild mountain sheep, goat, antelope, and wild ass can be commonly found.

CHAPTER III. ETT PROJECT'S SOCIAL IMPACT ASSESSMENT STUDY

3.1. Methodology and objectives

The aim of the scope of work is to audit the environmental and social management system of Erdenes TavanTolgoi Coal Mine, furthermore to develop the plan to improve it in order to support the equal social development and sustainability of the environment of Mongolia's mining sector.

- 1) To study the social administration system and the capacity of ErdenesTavanTolgoi JSC (ETT) for managing the environmental impacts of the East Tsankhi Coal Mine field.
- 2) To develop the action plan to strengthen the social administration system of ETT.

Following methods were used to gather the research data.

- ✓ Questionnaire;
- ✓ Interview;
- ✓ Analyzing the documents;

The methods above mentioned were chosen in order to collect the efficient and high quality information. Depending on the feature of its investigation detail and information to get in priority, these methods were used in following ways.

Questionnaire: It is the most proper method in the research of social science to assess the public idea, intension and trend. Therefore, through the questionnaire method, we collected the data on the people to identify and assess the social trend of ETT's East Tsankhi project and furthermore to support our research aim and to identify the action to be taken in the future.

Interview: It is the main method for gathering quality information. This method is appropriate to identify the reason, essence and principle of the information that gathered from the questionnaire sheet. Thus, the supporting information was collected to identify the reason and examine the data from the questionnaire sheet. Following communities were participated in the questionnaire and interview.

- i) Company staff;
- ii) Local government staff;
- iii) Public service organizations /hospitals, schools and police/;
- iv) Herders' representatives;
- v) Representatives from the small and medium business and industry entities;
- vi) Unemployed people;
- vii) Citizen's public organizations, specifically the environmental non-governmental organizations;

Document analysis: This method is more subjective and it gives realistic information to researchers. The documents were classified and analyzed as follow:

- i) Plan, related documents, previous studies and assessments reports of East Tsankhi project;
- ii) Statistic data, information and other activity reports;

Research sampling

It was planned to investigate the Tsogt-Tsetsii Soum in detail. Because, the main activities of ETT are carried out in Tsogt-Tsetsii and most of the impacts are resided in this area.

A total of 226 citizens were included in the survey and appropriate sampling design was pursued.

Age classes of survey participants

Table 3.1

Age classes	Percentage
Up tp25	18.0
26-35	42.4
36-45	25.4
46-55	14.2
Total	100

Within the survey participants, 31.1% were male, 68.9% were female. According to the education, 37% were bachelor, 10% were graduate, 16% were professionalized, 33% were skilled professionals, 4% were secondary school graduate, 0,5% were primary school graduate and 0,9% were abandoned from school /Figure3.1/. All types of employment levels were included in the survey such as government officials, private entities, public organization, herder, student, retired people and unemployed citizen.

Apart from the age classes and educational level, various levels of people were also included in their standard of living. This shows that sampling structure is evenly distributed throughout the study. This can be shown from the survey data of house types, ownership, and number of family members, average annual family income and employment rate of family.

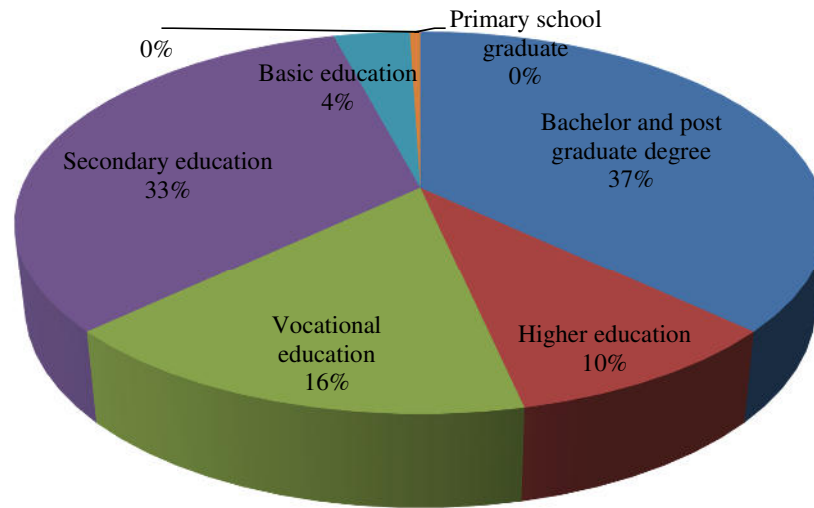


Figure 3.1. Educational level of survey participants

In total 79.3% of the survey participants live in private dwellings, 5.5% in rental house and 13.4% in the house of others. Furthermore, family members consisted of 18.6% with 1-2, 73.0% with 3-5 and 7.5 % with 6 and above. However, there are the number of the children 53.1% with 1-2 and 16.4% with 3-5 children.

Housing types of survey participants

Table 3.2.

Housing type	Percentage
Ger	46.6
Ger and house	31.9
Apartment	14.8
Rental apartment	4.9
House	1.4
Other	0.4
Total	100.0



Figure3.2: Number of Employed family members in household /by percentage/

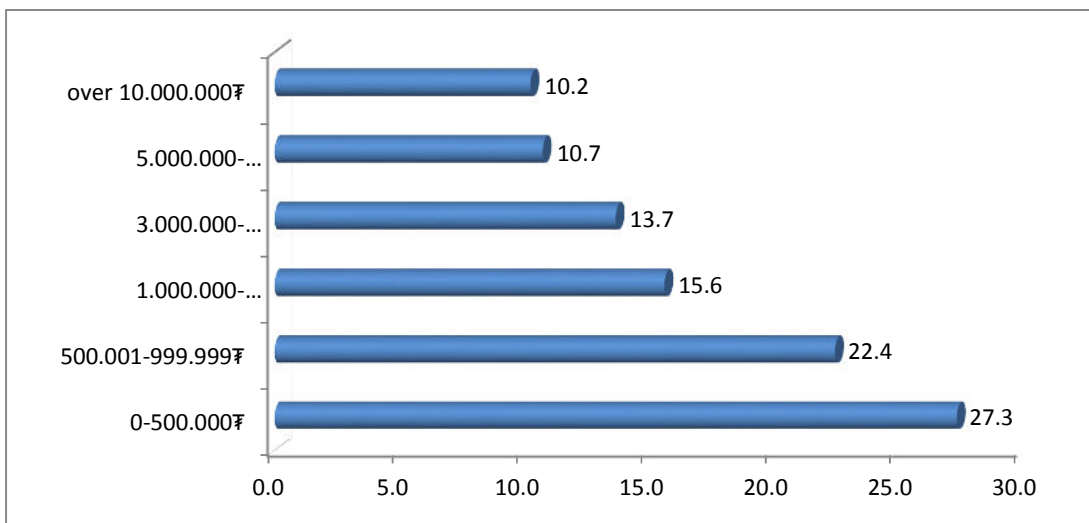


Figure3.3: Family income of 2013 /approximate/

3.2 Current social and economic condition of the Tsogttsetsii soum

The center of Tsogttsetsii soum is 90 km away from Dalanzadgad, and bordered with Tsogt-Ovoo, Manlai, Bayan-Ovoo, Khankhongor and Ulziit soum of Dundgobi aimag. It has territory of 724,600 km². Tavan Tolgoi coking coalmine with enormous resources is located 16 km from the soum center. The soum has plenty of mineral resources, such as saline, limestone, gypsum and chalcedony.

Population

As the population rate, Tsogttsetsii soum is the second biggest soum after Dalanzadgad, a capital of the aimag in accordance with the population statistics in last two years of the aimag.

Tsogttsetsii had an estimated population of 6108 as of the end of 2013, the numbers of families of 2128. Hence, the soum had the herders' families of 232 and herder population of 399 out of them. At the beginning of August 2014, 111 new births were registered and net growth of the population was 16, 7 percent. Whereas, there were 12 deaths as of the first eight months, reflecting a decrease twice compared to the same period of previous year.

Registered unemployed citizen

As of the first eight months of 2014, there were 91 job seekers registered in the soum labor department, of which 41 female, and 50 male. For education, seven of them are graduates, 3 special secondary school graduates, 5 vocational graduates, 61 secondary school graduates, 10 basic education graduates and 5 primary school graduates.

Social insurance

Tsogttsetsii was ranked at the top in the aimag as its amount of social insurance revenue. As of first eight months of 2014, 6305478.4MNT revenue was collected to the soum social insurance fund, likewise 4629131.4MNT in Dalanzadgad, the capital city of the aimag. Moreover, 340 citizens were involved in the voluntary insurance package in Tsogttsetsii soum. During this time, 624, 5 million MNT distributed to 291 pensioners.

Crime

As of first eight months of 2013, 48 crimes were registered in Tsogttsetsii soum. As compared to same period of previous year, it has increased to 63. The most registered crimes were the ones against human freedom and health /27/, theft /13/ and against traffic safety /9/.

Price

The consumer price index is an inflationary indicator, which measures the change in cost of a fixed basket of products and services when the items of goods and services are stable paid by consumers. At August 2014, the general consumer price index of the soum increased by 15.2 percent compared to the same period of previous year. Of which foods rose by 18.3 percent, alcohol beverages by 28.3 percent, clothing and textiles by 26.6 percent, household goods by 14.1 percent, medicines and health services by 8.0 percent, transport 5.2 percent, cultural stuff by 7.9 percent, education services by 7.6 percent, hotel service by 4.3 percent and other goods and services by 14.1 percent respectively.

Livestock husbandary

The soum had 65741 head of livestock and 16460 young animals born from 16410 female breeding livestock as of eight months of 2014. For the five types livestock, horse population is 4472, camel 2141, cow 778, sheep 21401 and goat 36949.

Industrial production

The total amount of 212198 million MNT productions was produced and sales of productions totaled 507908.8 million MNT as of first eight months of 2014. Hence, a majority percentage of sales revenue consists of ETT sales revenue because of exports.

State fiscal indicator

12921 million MNT accumulated in local community budget and 480,5 million MNT was spent from the budget as of the first eight months of 2014.

In the frame of social impact assessment of ETT, we proposed a group of questions to identify the current social condition of Tsogt Tsetsii soum, Umnugovi Aimag and interview data was collected from soum administration and public service organizations such as hospitals, police and schools.

The soum of 2000 people from 10 years ago has now grown up to 6000 people, including the temporary inhabitants and dwellers, it reaches to 15000 people. Once the number of people has reached to more than 20,000 when it was a peak time of coal export 2 years ago. There are 3 big coal mines of “Energy Resource” LLC, “Erdenes Tavan Tolgoi” JSC and local shareholder “Tavan Tolgoi” LLC are operating in the soum territory. “Due to the coal export cut, temporary resident number has decreased” said the government officials and residents.

Government leaders and residents have specifically notified that living a condition in the Tsogt Tsetsii soum has relatively improved due to the mine and coal export. Not only the increase in the population but also the socio-economic condition of native residents, immigrants, herders have been directly impacted by this and as well as the environment and government public service.

During the questionnaire, we proposed several questions on how people react on the activities of a) – public service, b) – Infrastructure of Tsogt Tsetsii.

Public service

Current situation of public services was assessed by:

- Government service
- Educational service
- Health service groups.

Government service

Quantitative and qualitative results of the survey data has shown that people’s attitude towards the government service is not satisfied. The result of the answers of question “*How are you satisfied to the government service in your soum?*” is shown as 21.0% satisfied, 32.7% moderately satisfied and 46.3% not satisfied.

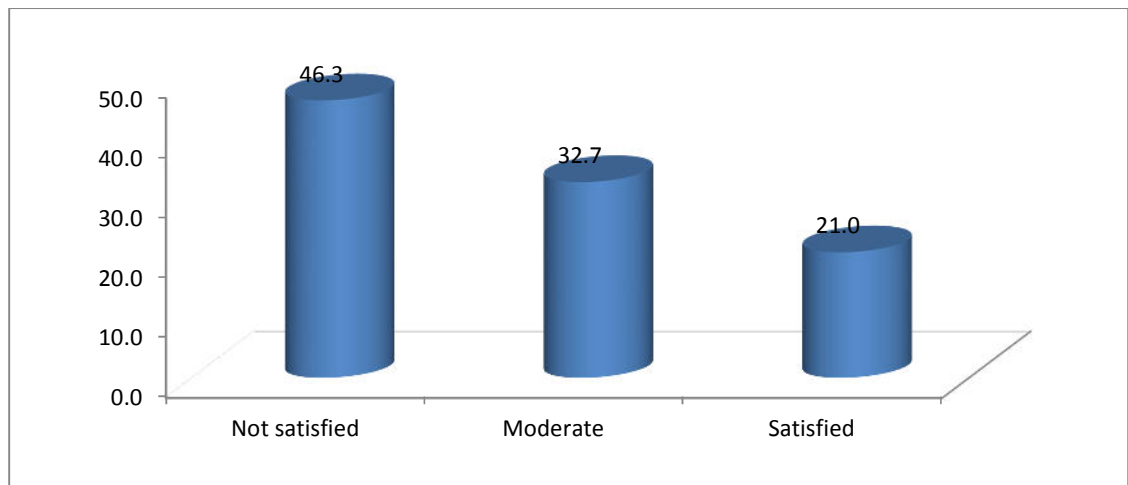


Figure 3.4: Satisfaction rate of Tsogt Tsetsii soum residents towards government service /percentage/

Having majority of the people not satisfied on the government service was explained by the government officials as the impact of population increase due to the intensive operations of coal mining. It has been notified by the representatives of the public services of hospital, school and police through the interview that the settlement followed by the coal mine has the impact on the sufficiency, quality and express of the government service. For instance, in 2013 there was an extension facility established for the police department and increased the number of staff. However, there was still difficulties in keeping the imperturbability of residents, reducing the number of crimes, traffic management and insufficiency in the finance, materials, techniques and workforce.

... As the development of construction and industry along with the natural resource use and mining activity, there is an enormous availability in the market arising. There is a constant rise in the transportation, restaurants, hotels and maintenance shops etc. Our soum has changed into a metropolitan as a result of the people coming from all parts of the country into this big market environment. You can see that no other soum centers can be compared with ours. It is only the private market entities are developing this region, not the government policy. But, I think the government activity is way too far from the speed of this rapid growing market. Before the coal mine activity, our population was 2147. Since 2006, when land license started, there was a constant increase in the population when Energy Resource has started operating from 2008. But government service is left behind as this increase of population. For instance, dust management, infrastructure, road network, kindergarten, school, health service and police etc. But we have been paying an attention on it since 2012, 2013 and started building hospitals...

Interview with Kh.Gerelmaa Deputy Governor of TsogtTsetsii soum



Figure 3.5: Interview with Kh.Gerelmaa Deputy Governor of TsogtTsetsii soum

Similar to the police department, there are still demand of workforce, facilities and finance for the schools, kindergartens and hospitals. The common problem facing the government

... Our police department supposed to have 27 staffs to work, but recently there are 14 staffs working. We have job availability but there is a lack of workforce and facing difficulties in covering all the people in soum. Traffic police is operated with 8 staffs. This is not enough. We work weekends. We are the police that do not get charged over the weekends. There is a government normative which does not actually happen in practice. According to that normative, 1 officer should cover 350 vehicles. But today there are 3700 heavy vehicles and 2400 light vehicles registered. Additionally, there are numerous vehicles from Ulaanbaatar and other provinces those not registered in the soum, constantly doing transport of coal and other trade. Even the coal export has stopped; we still cannot control them. It is very hard to imagine that how we maintain if 3 mines start operating. The accident rate is very high related to coal transport. Even there is a paved road, not all the vehicles are driven on it. There are also problems on increased road tax because of the carrying capacity of vehicle.

Another problem is that the alcohol selling and prostitution along the coal transport route. There was only one case recorded on drug dealing. There is no possibility of constant monitoring and workforce, fuel support is way too insufficient. We have a fuel budget of 1 million MNT per month which is not sufficient. Lots of calls come from the mines and we face to getting fuel support from the mines.

Interview with police officer, capitan Batjargal

service organization is that they provide services for both the registered residents and the temporary residents. So, there appears to be the insufficient budget and workforce residents and the temporary residents.

Educational service

Following assessment has been made according to the survey participants' poll of educational service of soum (Figure 3.6). There exist 2 public secondary schools operating in the soum and participants answered the question and assessed the school services. Three categories of assessment were made as satisfied, moderate and not satisfied. The results of all three categories

were somewhat similar to each other. But we should notice that there was a slight increase in the “satisfied” category.

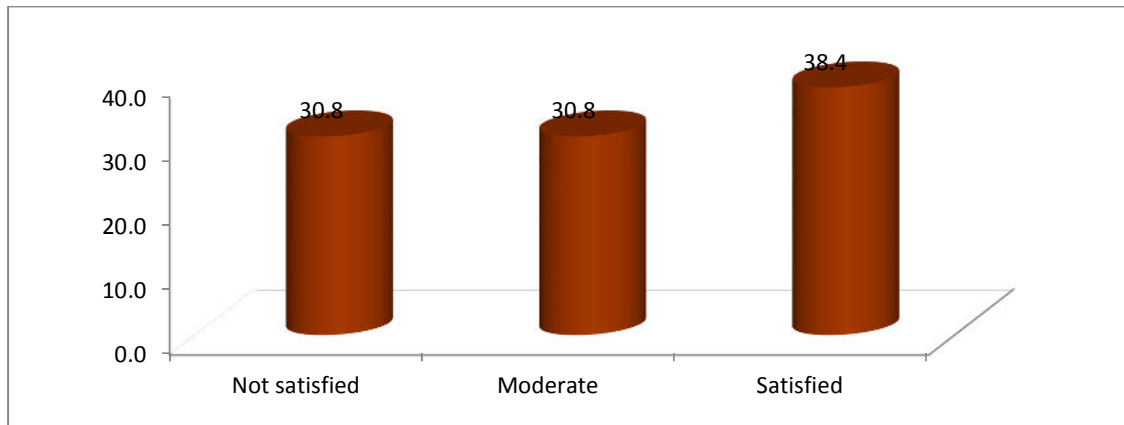


Figure 3.6: Satisfaction rate of Tsogt Tsetsii soum residents towards educational service /percentage/

In Tsogt Tsetsii, 1 state and 1 private school are currently operating. Energy Resource LLC has a close community relationship with soum government to support the facility in the educational sector. Energy Resource constructed a school of 640 children with a dormitory of 100 children and a kindergarten of 140 children for the soum government. This provided a positive score in our assessment. Newly established school provided by the Energy Resource LLC is a private school and majority of the children are the kids of the Energy Resource LLC staffs. But the state school is operating with the number of children 2 times the capacity of the school should normally hold and principal mentioned that it is really necessary to establish more school. Kindergarten is an important educational organization of pre-school period of children and it also facing the major problem in the soum. There are 2 state and 1 private kindergartens with 600 children operating in the soum.

... In the fall, we create a huge crowd like Ulaanbaatar to accommodate our kids to kindergarten. We have 2 state and 1 private kindergartens where a total of 600 children go to. We facilitated one more chamber in the kindergarten to place 100 more kids before. So, there was a high budget amount, and then it ended up closing the additional facility because of the audit from the Ministry of Education has noted that not obeying the standard per child. Not being able to facilitate 100 children had created big complain at that moment

Interview with Kh.Gerelmaa Deputy Governor of TsogtTsetsii soum

Soum government mentioned that it has been decided to establish a kindergarten with 200 children by government budget. However, it is still uncertain that how the money will be invested and its decision keeps being delayed.

Health service

Consultants conducted very detailed assessment within the survey participants. During the survey, health service was assessed through 3 indicators; institutional capacity, health service sufficiency and quality /Figure 3.7/.

During the survey we observed that residents were very crucial towards health service. This situation can be seen very certain from Figure 3.7.

There 48.4% was not satisfied in the capacity, 62.2% was not satisfied in sufficiency and 53.4% was not satisfied in quality respectively. The factors influencing the people's satisfaction towards health services are:

1. Insufficient number of beds and they have only 8,
2. Facility is too old, not enough space,
3. Not enough budgets.

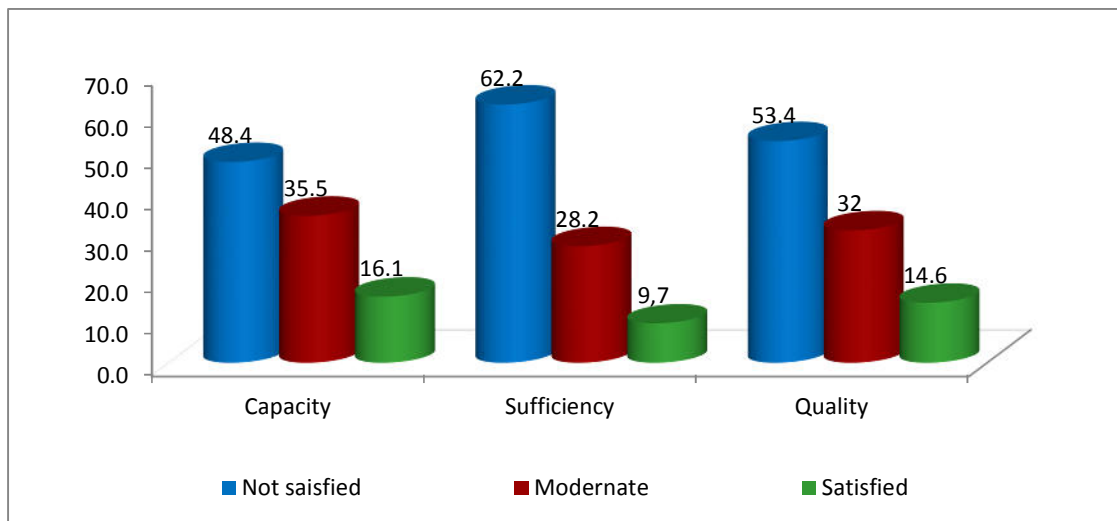


Figure 3.7: Satisfaction rate of Tsogt Tsetsii soum residents towards health service /percentage/

Due to the mining activity, transportation, temporary and traveling inhabitants' liveliness, number of traffic accidents, injuries and illness take place. This requires increased amount of budgets for medicines. Additionally, there is an insufficiency in the budgets of fuel for medical call in the countryside.

In order to improve the situation of health service, soum government authorities submitted number of request letters to relevant ministries and government. As a result, a decision has been made and new 50 bed hospital is under construction and expected to be completed in 2015. Hospital staffs have said that the situation will be much improved after the new hospital is built. Staffs have assessed themselves that the institutional capacity is satisfactory.

Population increase from the rapid increase of settlement activity followed by the mining companies operating in the soum territory has given much pressure on the state public services and local government is not able to fully support all the requirements from the public. Specifically, we conclude that education, health and legal enforcement services are in difficult situation of carrying out their services.

Infrastructure service

Some services of infrastructure have improved due to the development of mining operations. However, our study result revealed that more things shall be improved and needs to be pay attention in the future.

Most improved infrastructure sectors are electricity and communication (cell phone). The residents are happy with that soum electricity has connected to central power plant and all the cell phone operators are available in the area. But they are not fully satisfied with water supply, roads and waste management.

Water supply

It has been the major issues for soums and provinces of Mongolia’s Gobi region for its water supply, hygiene and quality. Water supply and facility for nomadic herders are not sufficient, lack hygiene condition and there are a lot of problems concerning on the disease and the life expectancy is being influenced by the quality of water. This is also the major issue for Tsogt-Tsetsii soum and local residents’ point of view has become more concerned on it due to the intensive mining development.

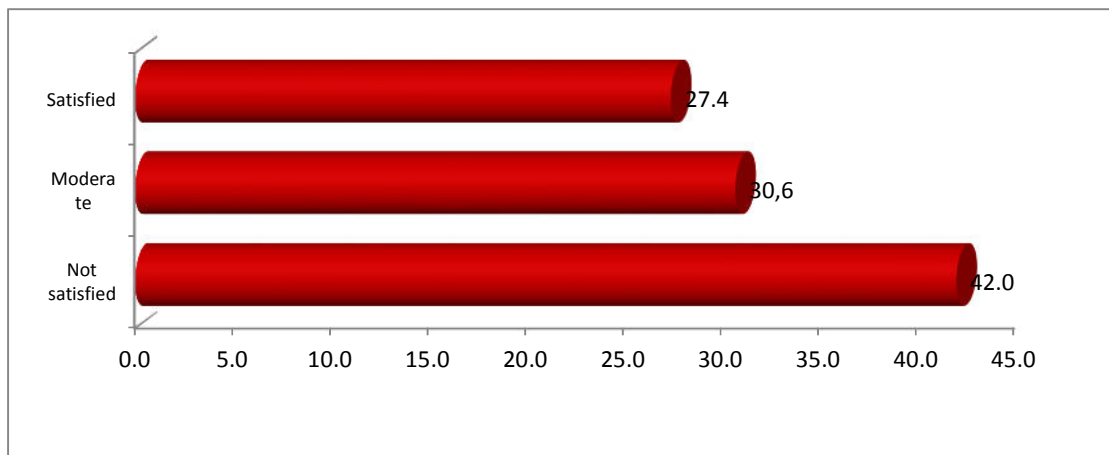


Figure 3.8: Satisfaction rate of Tsogt Tsetsii soum residents towards water supply /percentage/

Water supply for mining has become the most concerning topic for the local residents. 42% of the survey participants have answered that they are not satisfied in the soum water supply. In recent years, the number of investments has been made to establish new wells for herder from both the government and NGO’s. However, soum residents and herders complained that the tender companies have constructed the wells which are insubstantial, break down easily and they are not deep enough to get quality satisfied water. Furthermore, the more concerning issue comes from the coal mining operations that large amount of groundwater is being used for coal washing and concentration. Soum residents lack the knowledge and information about how much water is being used for mine, how they use, whether they reuse the water and apply the modern technology to use it sustainably for mine operations.

Waste management

It can be stated that there is a poor knowledge of waste management amongs the soum residents. Residents mentioned that there is no understanding more than how do we get rid of the waste generated by the soum household and mine operations. But, within the frame of their limited knowledge of waste management, residents gave us the score of bad waste management. Almost the half of the participants (49.6%) answered that they are not satisfied in the soum waste management.

People also mentioned that they are really concerning on the coal mines leave behind their entire open pit and waste dump after they finish exploitation.

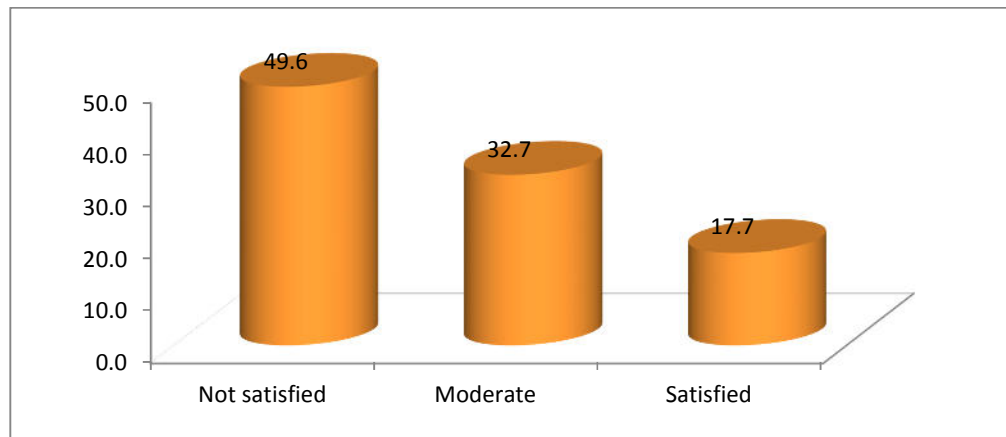


Figure3.9: Satisfaction rate of Tsogt Tsetsii soum residents towards water supply /percentage/

Road and other infrastructure

Residents are happy with the construction of new Ulaanbaatar-Dalanzadgad highway. However, they are still requesting to construct paved road between Dalanzadgad and Tsogt-Tsetsii where there is a 90 km of enhanced dirt road. They were also appreciated with the paved road in the town area which was constructed by Energy Resources LLC. Likewise what Energy Resources has done, people also mentioned that Erdenes TT also does need to participate in new constructions in soum and road pavement between the mine and soum center as well. It has been observed that people were agitated by the ETT activities because the mine is situated at the West side of soum, from where the dust is generated by the many branches of roads which leads into soil erosion.

A dirt road for coal transportation is the most concerning issue for herders. Energy Resource has constructed 200 km new paved road until the Mongolian border, however, very few trucks use it and many other trucks are still driving the dirt roads nearby which creates dust generation impacting the surrounding environment. Main reason is that road tax is very high for heavy trucks and many vehicles are not allowed to use the road because of overweight problem. 54% of the survey participants were not satisfied 26.3% were moderate and 19.6% were satisfied on the infrastructure condition of Tsogt-Tsetsii /Figure 3.10/

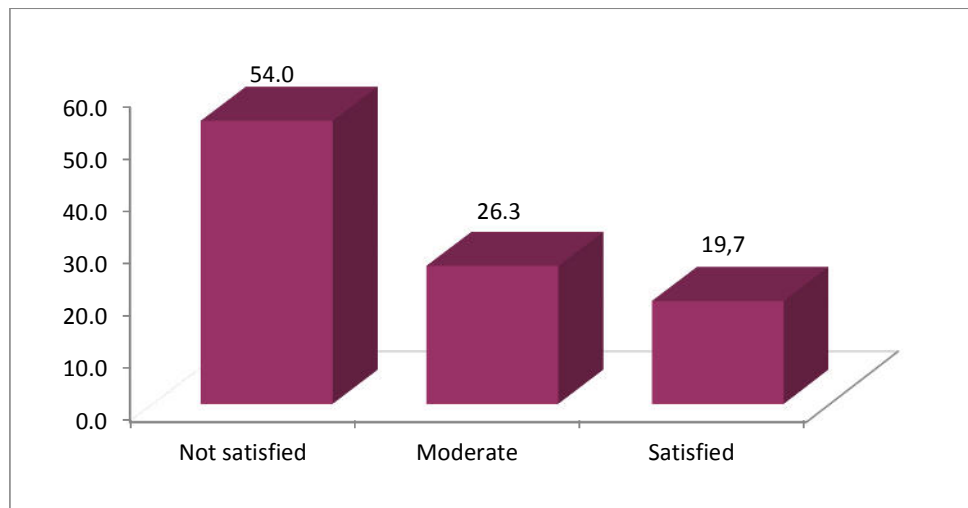


Figure 3.10: Satisfaction rate of Tsogt Tsetsii soum residents towards water supply /by percentage/

Despite of road construction, residents have a request of making a sound decision on infrastructure development. They specifically mentioned the power plant of Erdenes Tavan Tolgoi coal mine. Many people had raised an idea of constructing the thermal plant for the future of Tsogt-Tsetsii under the advance of coal deposits. This way, we will come up to the solution on arranging the town water supply which will be the fundamental for apartment construction for comfortable livelihood of soum residents. Residents are appreciated towards the construction of apartment buildings by Energy Resource. These apartment buildings manage their water supply and sewage by operating a boiler house.

3.3 Challenges of the Tsogttsetsii soum

Survey participants of Tsogt-Tsetsii soum were also questioned for the most urgent problems that need to be solved in recent situation. We ranked the key problems facing to them and shown as ascending order in Table 3.3.

Key issues of Tsogt-Tsetsii soum

Table 3.3

Indicators	Quantity	Percentage	Rank
1. Environmental issue	113	52.6	I
2. Economic crisis	103	47.9	II
3. Unemployment	74	34.4	III
4. Health	58	27.0	IV
5. Administrative capacity	46	21.4	V
6. Crime	43	20.0	VI

7. Water deficiency	41	19.1	VII
8. Poverty	35	16.3	VIII
9. Corruption	33	15.3	IX
10. Discrimination	17	7.9	X
11. Natural disaster (drought, zud)	14	6.5	XI
12. Other	12	5.6	XII

According to the ranking order above, it can be stated that main problems for Tsogt-Tsetsii residents come from the mining activities. Every herder family members we met along the coal transportation corridor have mentioned that major environmental adverse impacts were affected by the coal transport roads, not the mine itself. Main environmental impact from the coal transport is dust. Heavy weight loaded vehicles traveling on the dirt road lead to a soil erosion of relatively vulnerable desert soil and really fine particles of dust is generated from the soil. Herders criticize on this as ecological catastrophic event is nearing the surrounding environment in the future.

Ranked as 2 and 3 in table 3.3, economic crisis and poverty are also the consequences of mining activity. 2-3 years from now when it was a peak period in coal export, the situation was different. Enormous process of people moving in lead into intensive marketing, trade and private public businesses such as restaurants, hotel, maintenance shop, transportation and taxi services. As a result of this, extensive economic development grew up, increased money flow and nearly everyone running private business has turned people's livelihood plentiful. But in the last 1.5 years, a dramatic reduction of coal export has lead into reduced public business services and regional economic crisis which caused increased unemployment rate. Many truck drivers left unemployed and trucks remain non-operational in their yard. Sale process of grocery markets slowed down and number of customers for restaurants and hotels had rapidly decreased. These private businesses are run by the people who moved in from neighboring provinces, soums and Ulaanbaatar. Majority of the soum residents are herders and rest of them work for the local government administration.

... Herders living along the coal transport route wear dust protection mask on their faces, hair is covered by dust and skin of their livestock turned into smutty black. This is very sorrowful and eye trashing when we see it. Real pastureland livestock skin supposed to be white but... When we slotter them and see the inner organ, the lungs are deceased, cleaved into the ribs and size of the kidneys are shrunk. Not only the environment, is it also harmful to livestock. Herders escaping from this situation have to move to the neighboring bag territory. Then it becomes the pasture carrying capacity problem.

Dust generated from the coal transport line raising harm not only to the surroundings but also to the wild fauna and flora. Wild animals are being moved away from their habitat and facing problems crossing the road to migrate.

Interview with Kh.Gerelmaa Deputy Governor of TsogtTsetsii soum

... We may say that the benefits of market availability from the mining activity are mainly claimed by the people moved into our soum from neighboring provinces and soums. It is not us that gaining the benefit. All the private businesses such as shops, restaurants, hotels and maintenance shops are run by outsiders. Just like, we parents can not really see our children growing up so quickly, we also can not see the possibility of this in reality. On the other side, people who have a reasonable amount of money move into the Tsogt-Tsetsii and buy the land, yard or house in cheaper price and start building hotels, shops and restaurants. Only after a while, the price of the land increases and new owners become successful in their business. You can see that luxury restaurants like Modern Nomads and Broadway are operating in the soum center.

Interview with Munkhbat, resident of Tsogt-Tsetsii



Figure3.11: Residents of Tsogt-Tsetsii have done Questionnaire

When consultants have analyzed the information from the soum residents on the first 3 major problems in the ranking order, it is somewhat related to the mining activity. Besides these, it is a bit odd to relate the other problems identified by soum residents such as health, government institutional capacity, crime, water deficiency, corruption, discrimination and natural disaster into the mining activity. It is certain that other local factors can affect the social and economic situation.

In the frame of study, the aim of identifying the current socio-economic condition, general situation of soum center and major problems facing Tsogt-Tsetsii was to support ETT in strengthening their community relations management and implementing the social responsibility through communicating the local residents for their future activity of intention to expand the activity in the soum territory.

3.4 Community attitude towards ERDENES TAVAN TOLGOI JSC

Knowledge of ETT and information source

Soum residents have not enough knowledge apart from, there are 3 coal mines operating in the soum territory. Majority of the people have only the information that local shareholded TavanTolgoi LLC (they were not sure that it is still a local shareholder company) operating in the last 50 years, Energy Resource LLC, a private company running a coal mine since 2007 and ErdenesTavanTolgoi LLC, a state property company are operating in the soum territory and exporting coal but, they are different from each other in their investment ownership.

10 of the survey participants have a good knowledge about ETT which covers only 4.6% of them, 47.5% were only heard of ETT and 47.9% had no idea at all.

Tsogt-Tsetsii soum residents' knowledge of Erdenes Tavan Tolgoi LLC

Table 3.4

	Quantity	Percentage
Good information	10	4.6
Little information	103	47.5
No information	104	47.9
Total	217	100.0

During the survey data collection, we observed that people had some information about Energy Resources but very poor information on ETT. There can be 2 main reasons that people do not know much about ETT. First, ETT has recently established, started operating quite lately and activity has not become versatile yet. Second, ETT has not enough community relation with

the local communities as well as the lack of information to the locals about the company activity.

Therefore, it is recommended to carry out the management to improve the community relations management through introducing company activity, policy, strategic aim, responsibility in the local development, environmental protection activity and rehabilitation practices to the local communities who expect necessary information and constantly organizing advertisement activities to raise the company fame.

In overall, 40.8% of the survey participants have got the information about ETT from the words of mouth by others, 29.9% got news from television and 11.9% from our recent survey. /Figure 3.12/. Having majority of the people receive the information from rumors is not realistic and situation is risky. There is no warrant in the rumor and it is certain for everybody that it does not always correspond in a real life. Therefore, ETT should provide an official information sources to local communities.

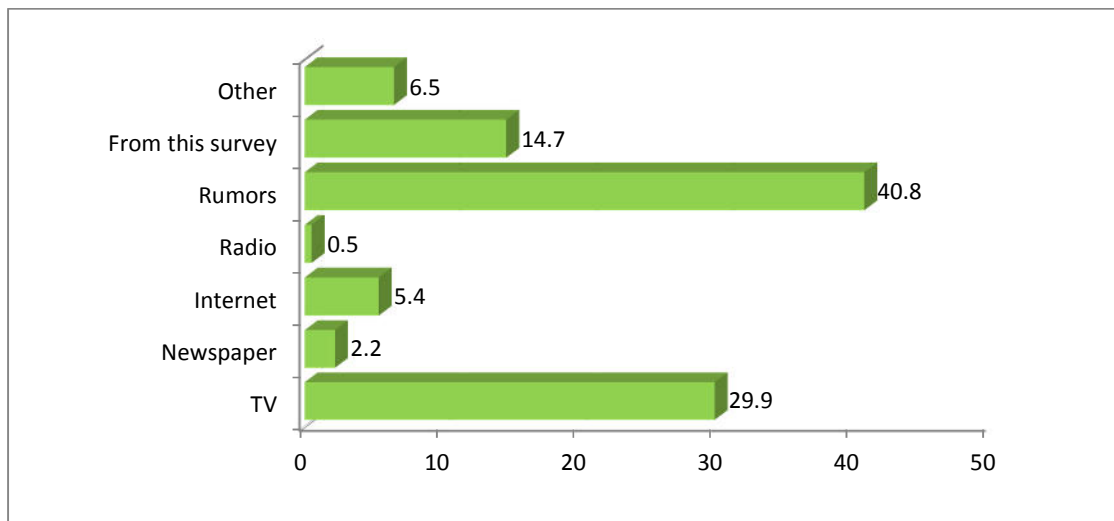


Figure3.12: Information source of residents about ETT /percentage/

Positive and negative approach towards ETT activity

Even though, there is a lack of information about ETT amongst people and coal transport is experiencing bad consequences to local communities, survey result showed that people’s attitude towards coal export is not that contradicting. 82.1% of the survey participants expressed their opinion that they are happy with ETT coal mine operation at East Tsankhi region. Survey participants explained that mine development will help the local development through increasing the employment rate, beneficial to the regional economy and development, as well as country’s development /Figure 3.13/. But 17.9% did not support the idea of coal mining at the East Tsankhi region and reasons are shown in Figure 3.14. According to the figure, it can be seen that there are several aspects which are pulling into attention and worthy to think over. The major issues that we mentioned in the previous chapter are also restated in the figure.

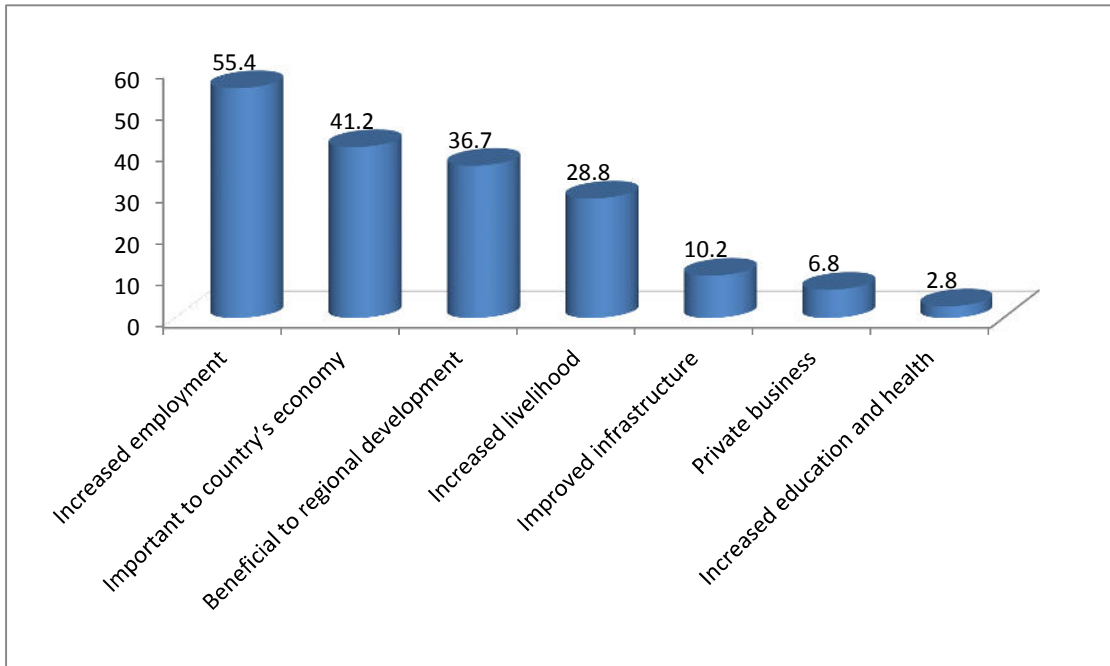


Figure 3.13: Reasons for positive attitude towards East Tsankhi coal mine /percentage/

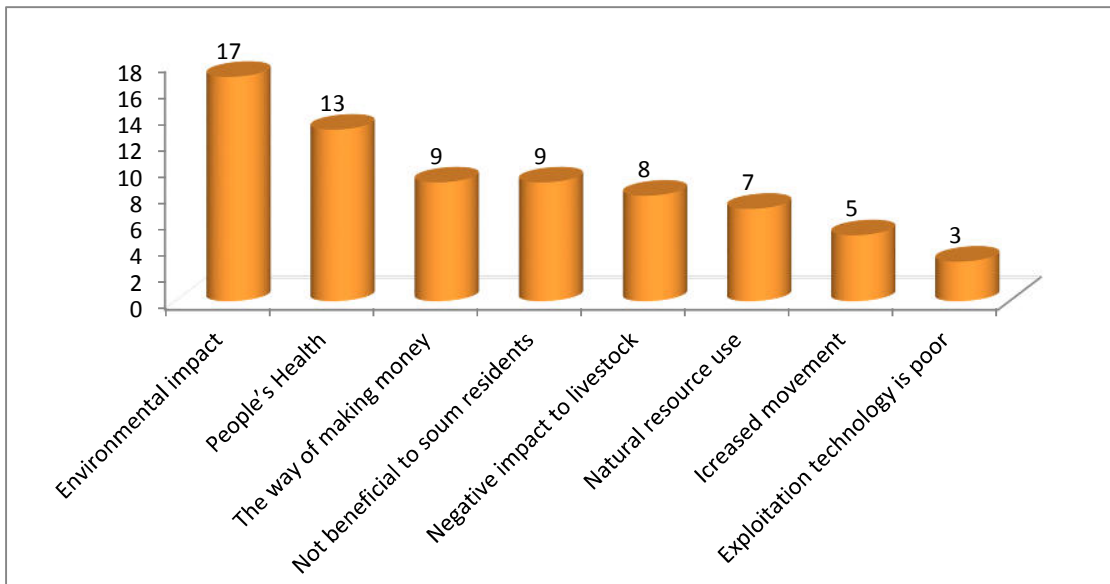


Figure 3.14: Reasons for positive attitude towards East Tsankhi coal mine /number of people/

Therefore, ETT should strengthen their community relations management through advertising the company policy and activity in a proper way and organizing meetings to deliver information for both the people who are happy with mine operation and the people who do not. We conclude that successful and efficient advertisement of company policy and activity is crucial for local communities' support for mine development. Even, there is a lack of

information on ETT along the locals, 82.1% of people are happy with mining activity. This describes the great expect from local community and as well as the company responsibility.

Population’s concern on mine exploitation and coal transport

With no regard to the people’s agreement and disagreement of mining activity in the soum territory, we proposed one question on the key issue that people aware of in general. We classified it into 2 categories; those are environment and social condition. Survey result revealed that the environment was the most concerning issue. Of the 6 issues concerning the environment, most of the people (above 50%) had concerns of environmental problems except coal mining /Table 3.5/.

Regarding with social aspects, 46.9% of the people concerned on health issue which was the highest indicator, 36.9% concerned on the future increase in the traffic movements related to the East Tsankhi coal mining and 36.7% concerned on the crime. Even, people concerned the social aspect in a certain way; it was the relatively lower concern than the environmental concern. But this is not the case that we should not pay attention and 25.0-35.0% of people concerning the social aspect is not a minor issue. /Table 3.5/

Survey participants filled the questionnaire form with negative and positive chances from the intensive coal mining of East Tsankhi region and majority of them or above 60% agreed in the possibilities /Table 3.6/.

Tsogt-Tsetsii soum people’s concern on East Tsankhi mine exploitation and coal transport

Table 3.5

	No concern	Moderate	Concern
A. Environment			
Impact of groundwater	7.0%	23.7%	69.3%
Air pollution	5.4%	20.4%	74.2%
Natural resource use /coal/	14.6%	41.7%	43.7%
Soil erosion, drought	4.5%	21.8%	73.7%
Vegetation	5.8%	31.2%	63.0%
Waste management	8.9%	37.4%	53.7%
B. Social			
Health service	13.3%	56.0%	30.7%
Citizen’s health	8.2%	44.9%	46.9%
Crime	10.9%	52.4%	36.7%
Livelihood	16.7%	52.8%	30.5%
Social and cultural conflict	21.5%	52.9%	25.6%
Traffic increase	18.4%	44.7%	36.9%
Immigration	22.0%	52.8%	25.2%
Institutional capacity /ETT/	28.8%	44.7%	26.5%
Politics	27.5%	45.8%	26.7%
Education	26.7%	47.4%	25.9%

Agreement with positive and negative thoughts

Table 3.6

Positive thoughts	Yes	No	Not sure
Beneficial to country's economic development	63.7%	7.1%	29.2%
Important to regional development in Gobi	67.1%	7.6%	25.3%
Dramatic impact to Tsogt-Tsetsii regional development	66.9%	9.9%	23.2%
Increased employment and income	75.7%	9.6%	14.7%
Growing condition of private business, public services and trade	75.5%	10.4%	14.1%
Negative thoughts			
Adverse impacts to the wildlife and ecosystems of Gobi region	72.8%	12.4%	14.8%
Adverse impacts to herders' livelihood surrounding the mines	73.4%	13.9%	12.7%
Harmful to the residents health	74.2%	12.3%	13.5%
Depending on the new people moving in to the region, other public counter activities such as crime will arise	63.5%	9.6%	26.9%

Comparison of coal mines activities in Tsogt-Tsetsii soum

Recently, there are 3 coal mining companies operating in TavanTolgoi coal deposit regions in Tsogt-Tsetsii soum and transporting coal into China for export. Questionnaire form included the main activities of those mines were compared and assessed by survey participants.

Social responsibility of the company

Energy Resources LLC was scored at best in terms of social responsibility. During the interview using quality research method, people appreciated that Energy Resource has a good community relations management implementation and their action can be seen by eyes, for example, constructing facilities.

... "Shine Bayanburd" is a comprehensive program. Farming is a support program to support small and medium businesses. For last year 90 million or "Shine Bayanburd" project is planned for work completed. This year more than 100 million budgeted. If this one works towards corporate social responsibility within the community. In addition, road lighting, school maintenance, such as inter-hospital ambulance. Teams in order to support a team of small tractors, to build green communities have been planted with trees.

Interview with I.Enkhbayar, the camp manager TsogtTsetsii soum



Figure 3.15: Interview with I.Enkhbayar, the camp manager TsogtTsetsii soum

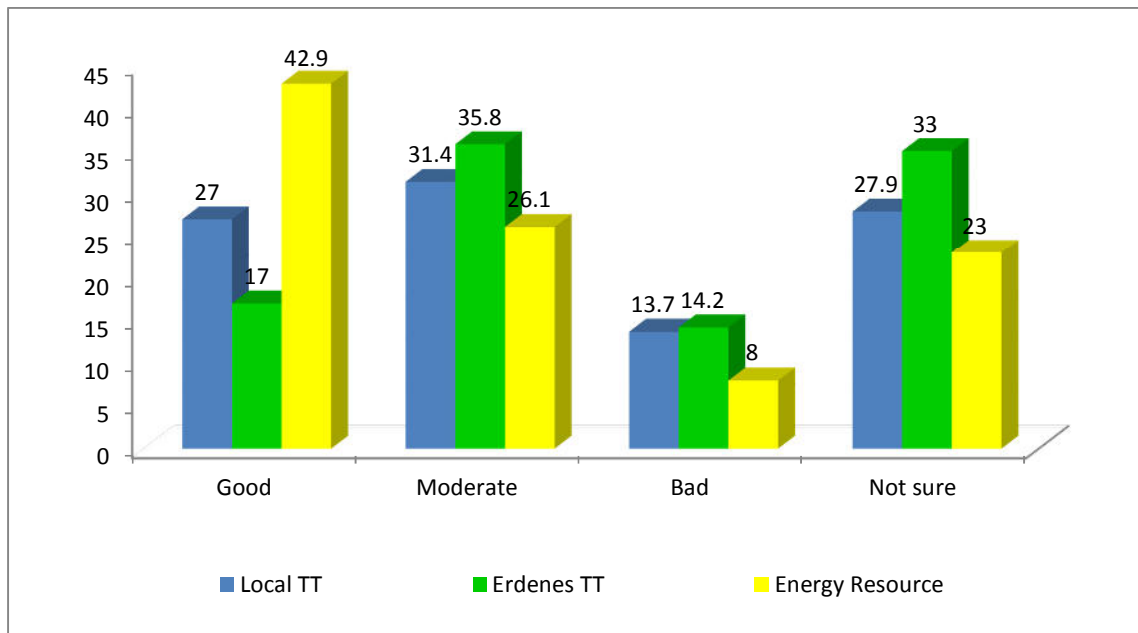


Figure3.16: Assessment of companies in terms of their contribution to regional development. /percentage/

Contribution to the regional development, investment and benefit:

Energy Resources LLC was also scored at best in terms of this assessment. But some of the survey participants emphasized that all three companies are various in their activity and the duration of operation. For instance, compared to other 2 companies, Erdenes Tavan Tolgoi LLC has recently started their operation and it should be taken into account that ETT has not had possible time for investment into local community.

Researcher: On behalf of you are the local government official, how do you make an assessment in 3 companies community relations management?

I think Erdenes Tavan Tolgoi is not good at this. Generally, it is quite poor. We agreed a memorandum of collaboration and we the government agency are doing best we can. It is quite difficult for us to obey the camp rules of ETT. It might be sound idea if the workers camp is based at soum centre and they go to work by scheduled bus. Camp management gives not much economic benefit to the soum. They do not even buy single bread from us. But shall not say that they do not do anything. These 3 companies help us with the things like winter preparation and workforce according to their availability. ETT is helping us with paying students tuition and tons of coal and winter feed for livestock. But they still need to pay attention on the social responsibility. It would be very beneficial to us if they facilitate their workers' kindergarten and school etc. This would give us a lot benefit. There will be private companies won't remain behind as the state company leads.

Interview with Kh.Gerelmaa Deputy Governor of TsogtTsetsii soum

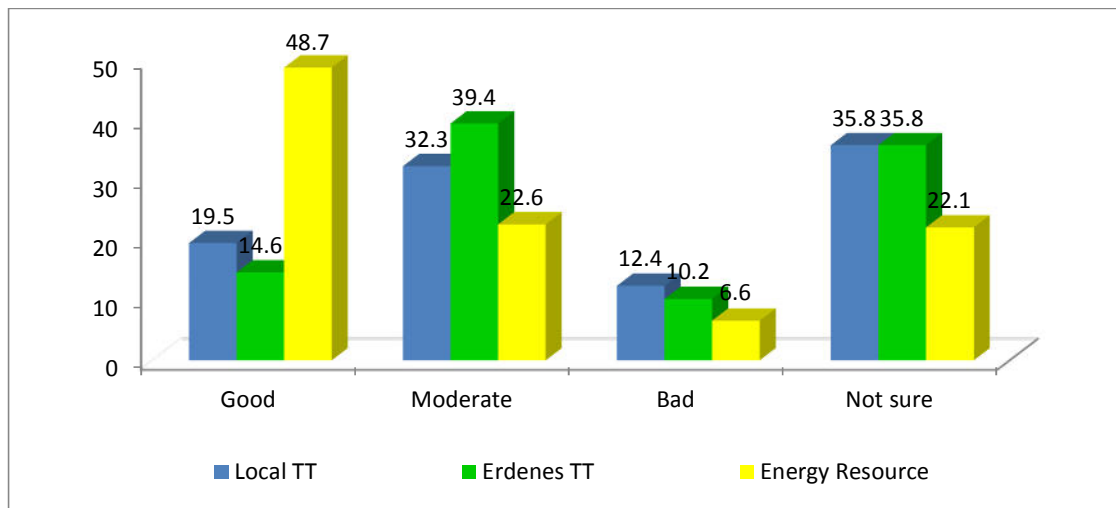


Figure3.17: Assessment of companies in terms of their contribution to regional development. /percentage/

Employment of local residents

Erdenes Tavan Tolgoi has 66 employees from Tsogt-Tsetsii and 59 employees from other soums in Umnugobi province. Out of 439 workers at ETT, 28.4% were from Umnugovi province whereas 15% of the workers are from Tsogt-Tsetsii.

... Former director of our department, now he is an administration director, used to hire as many local employees as possible. Recently there is not much going on for hiring locals. Since we made a contract with catering company in UB since August, 2013, all service workers such as cleaners, drivers and kitchen staffs left unemployed. But we are still hiring locals for available jobs.

... We try to hire as many locals as possible if there is a chance. Another system is that job application materials of locals have to be sent to UB office and decision is made there. Since, approval process takes place at main office; we do not have much authority to hire as we want.

Interview with Odontsatsral Camp HR officer of Erdenes TT in Tsogt-Tsetsiisoum

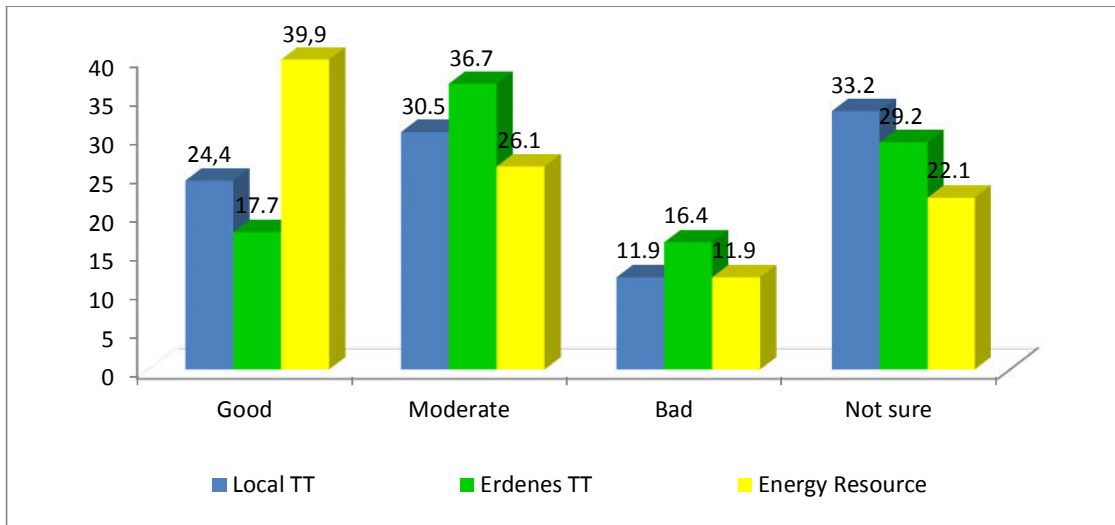


Figure 3.18: Assessment of 3 companies in terms of their employment of locals/by percentage/

Mine rehabilitation

According to Erdenes TT, mine operation has recently started, therefore, rehabilitation issue can be discussed in the Chapter 5.

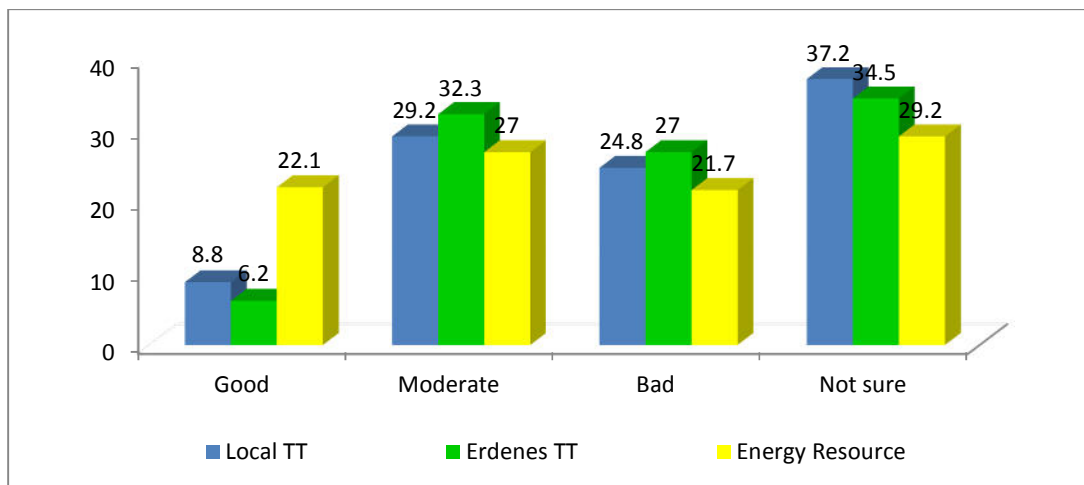


Figure 3.19: Assessment of 3 companies in terms of their mine rehabilitation

Condition of contribution to the regional public matters (education, health)

Local residents have complained that Erdenes TT has not paid any attention on regional public issues such as education and health. Many residents have stated that several accomplishments were made by Energy Resources by constructing new schools, kindergartens and apartment blocks which were the good contribution to the regional public development and other companies shall take this into account.

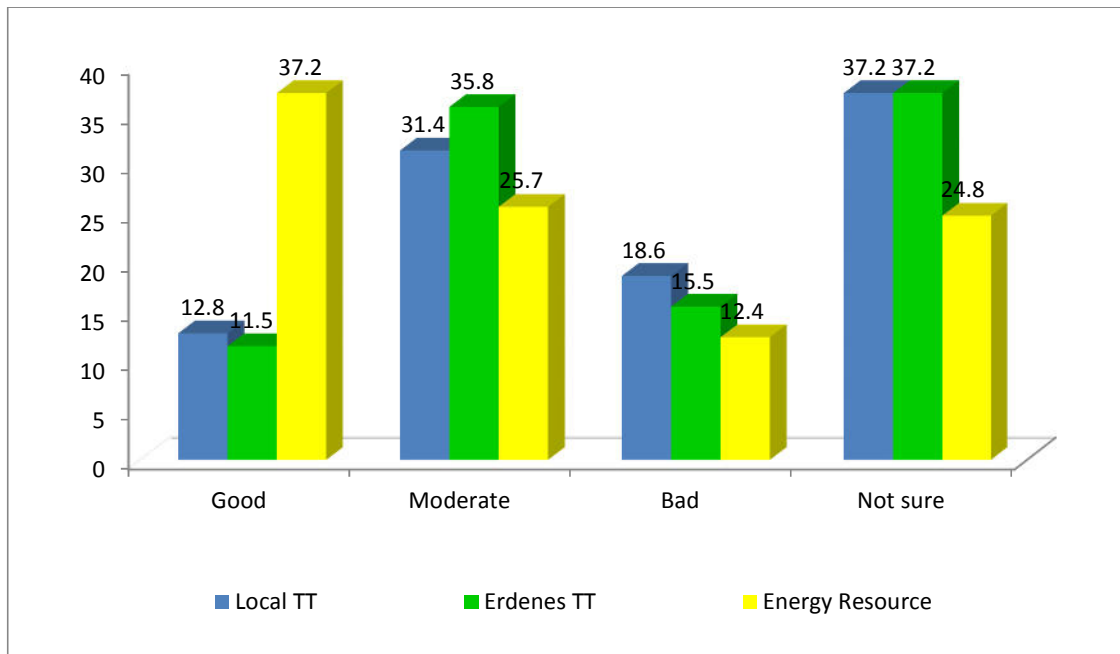


Figure 3.20: Assessment of 3 companies in terms of their contribution to the regional public matters

CHAPTER IV. ERDENES TAVAN TOLGOI PROJECT'S ENVIRONMENTAL SAFEGUARD ACTIVITIES

It is necessary to define the activities of the ErdenesTavanTolgoi (ETT) project that can interact with the environment in order to plan relevant tasks to reduce potential adverse impacts during the mining. The main environmental aspects cover air quality, water resources and its quality, soil, subsoil, plants, animals and wastes. Detailed Environmental Impact Assessment (DEIA) determines manners, scale, duration, source, and dispersion, scopes of adverse impacts and name, types, scale, scopes of items to be likely affected by the proposed projects implementation. Improvement targets of ETT East Tsankhi coalmine's environmental management are divided into three phases and the following seven main targets were identified and fulfilled.

Phase I:

1. Compile the national legislation acts on environmental management improvement of the company.
2. Evaluate implementation of environmental safeguard requirements, particularly the requirements under the policies of World Bank's activities within the international financial institution's safeguard policies;

Phase II:

3. Conduct a performance audit on the recommendations written in the DEIA report, and through the audit to determine the implementation of the company's environmental safeguard policy. Moreover, visit in the mine site and checkout the reality.
4. To accomplish a control on EIA report and reveal issues not covered in the report; and develop additional recommendations to mitigate exposed adverse impacts
5. Analyze the company's environmental management system and structure and make related recommendations for improvement.

Phase III:

6. Develop an action plan for Environmental Management System (EMS) improvement of the company, divide it into three-time period, and place the immediate activities into the short-term plan.
7. Outline the timed planning to implement the action plan

In order to achieve the above targets, we worked in Ulaanbaatar office of the company, visited the mine site from 27th of November until 30th of November 2014, and familiarized the real situation.

General conclusion:

There are some considerable nonconformance related to mine site arrangement and organizational structure and management of the department in charge of environmental issues, and its assignments, specialization and legal knowledge, improper corporate governance in the EMS. Thus, it is useful to learn an international well-known practices and EMS of OyuTolgoi LLC (OT), which is the closest. Otherwise, the above non conformance will exist in the future.

Decisive approach:

The issues will be evenly solved and the activities will be improved when enabling to set the structure and components of the department in charge of environmental issues, assignments and EMS within the corporate governance, which are the most significant ones of the below mentioned issues and enhancing the understanding of management team of the company on environmental aspects.

4.1 National legislation on the environmental management improvement

The chapter discusses the seven subsections included in the concept of Environmental Management Improvement and its applicable national legislation. The collection includes: as overlapped number, legislation applicable to environmental and structural management – 103, water environment management – 96, to air quality, gas emission and climate management – 75, to soil environment and land management – 95, biodiversity management – 111, to rehabilitation and mine closure management – 37 and to waste management – 36.

Besides the requirements set by the international investors, the international agreements and conventions acceded by Mongolia, national legislation, program, resolutions by the parliament and government, orders of relevant sector ministers, agencies, department heads, citizens representatives meetings, standards etc should be applicable to environmental management of ETT East Tsankhi Mine. Therefore, it is prudent to take account of essential environmental composition and factors affecting it:

1. Environmental management, structural system
2. Water environment management
3. Air quality, gas emission and climate management
4. Soil environment and land management
5. Biodiversity management
6. Rehabilitation and mine closure management
7. Waste management

The national legislation applicable to above directions are valid as of July 1, 2014 and any amendments, renewals are included in it. It is necessary to use the following legislation in improving environmental and structural management and they are used at the level of environmental department head.

It is necessary to obey the Appendices ii-vii legislations on environmental and structural management and they should be applied at the level of environmental department head.

The following state and professional institutions related to the above law and legislations will mainly involve in mine operation. Herein:

- ~ The Ministry of Environment and Green Development
- ~ The Ministry of Mining and Energy
 - o Agency of Specialized Inspection
 - o National Agency of Meteorology Hydrology and Environmental Monitoring
 - o Mineral Resource Authority
 - Other professional institutions

4.2 Due diligence on environmental protection within the international financial institutions' safeguard policies

In order to ensure the environmental effective management of ETT East Tsankhi coalmine, the environmental requirements of either World Bank (WB) or Asian Development Bank (ADB), and European Renaissance Development Bank (ERDB), which are suitable to our country, were reviewed. The policy guidance documentations are designated to ensure effectiveness of mining operation were described for each of these three banks.

In accordance with the WB Operational Plans (OP4.1-OP4.12), establishment of the planning and capacity improvement measures are specified within the frameworks of policy, legislation, coordination and management. The international banking institutions designed the safeguards policies to promote sustainability of project outcomes by protecting the environment and affected people from potential adverse impacts, where possible. Moreover, the policies are developed to minimize, mitigate, and/or compensate for adverse impacts on the environment and affected people when avoidance is not possible; and help the project implementers to strengthen their safeguard systems and develop the capacity to manage environmental and social risk.

Proposed projects are screened according to type, location, scale, and sensitivity and the magnitude of their potential environmental impacts, including direct, indirect, induced, and cumulative impacts. Projects are classified into the four categories. Generally, the classification principles are similar, but there are some slight differences as seen the classifications of WB and Asian Development Bank (ADB):

World Bank:

There are 10 environmental and social security policy documents prepared and approved by World Bank.

- ~ Operational policy (OPs): This is the policy documentation that designed to ensure the Bank policy and makes it more specific based on bank agreement, general term, and policy approved by General executive officers.
- ~ Bank procedures (BPs): This is the documentation to provide banking employees guidelines, which contain general statutory obligations to comply with OPs.

The proposed project is classified into four categories, depending on the type, location, sensitivity, and scale of the project and the nature of its potential environmental impacts.

The outline of the World Bank OPs are shown in the Chart 4.1 and briefly summarised as below:

Category A:

A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are unrecoverable, diverse, or big scale. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and

improve environmental performance. For a Category A project, the borrower is responsible for preparing a report, normally an EIA (or a suitably comprehensive regional or sectoral EA) that includes, as necessary, elements of the other instruments.

Category B:

A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases, mitigatory measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A EA. Like Category A EA, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The findings and results of Category B EA are described in the project documentation (Project Appraisal Document and Project Information Document).

Category C:

A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.

Category FI:

A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

In accordance with above, the adverse impacts affecting environment and society of ETT East Tsankhu coalmine is duly classified as Category A project.

Highlighted ones in green in the table mean those are implementing in certain areas, yellow one indicates poor implementation and range one expresses not implemented. For instance:

OP4.01

- ~ EIA was developed at the project development stage but it was not well integrated with the project structures and management.
- ~ The borrower has not made the draft EA report available at a public place accessible to project-affected groups and local NGOs.
- ~ The EA covered only the main activity – mining but the supporting aspects such as workers' camp, transportation road, electrical transmission lines and Fuel Station were not specified in it.

OP4.02

- ~ EMP and its implementation report are developed on annual basis, although there was no short, medium and long term EMP of the company, which was prepared on each environmental components
- ~ The environmental specialists' proficiency and involvement in training are not satisfied.

OP4.04

- ~ The study on the natural habitats was conducted in the DEIA, designed in 2011. Since then any studies on fauna have not been completely carried out.

OP4.07

- ~ Within the framework for water resources management, the significant works for example: softening the mineralized water of the gobi region and use of rainfall water have not been performed. However, the seepage water is used for watering roads in order to eliminate dust. The potable water is transported from the city.

OP4.09 and OP4.36 are not relevant to the operation and environmental policies of the mine.

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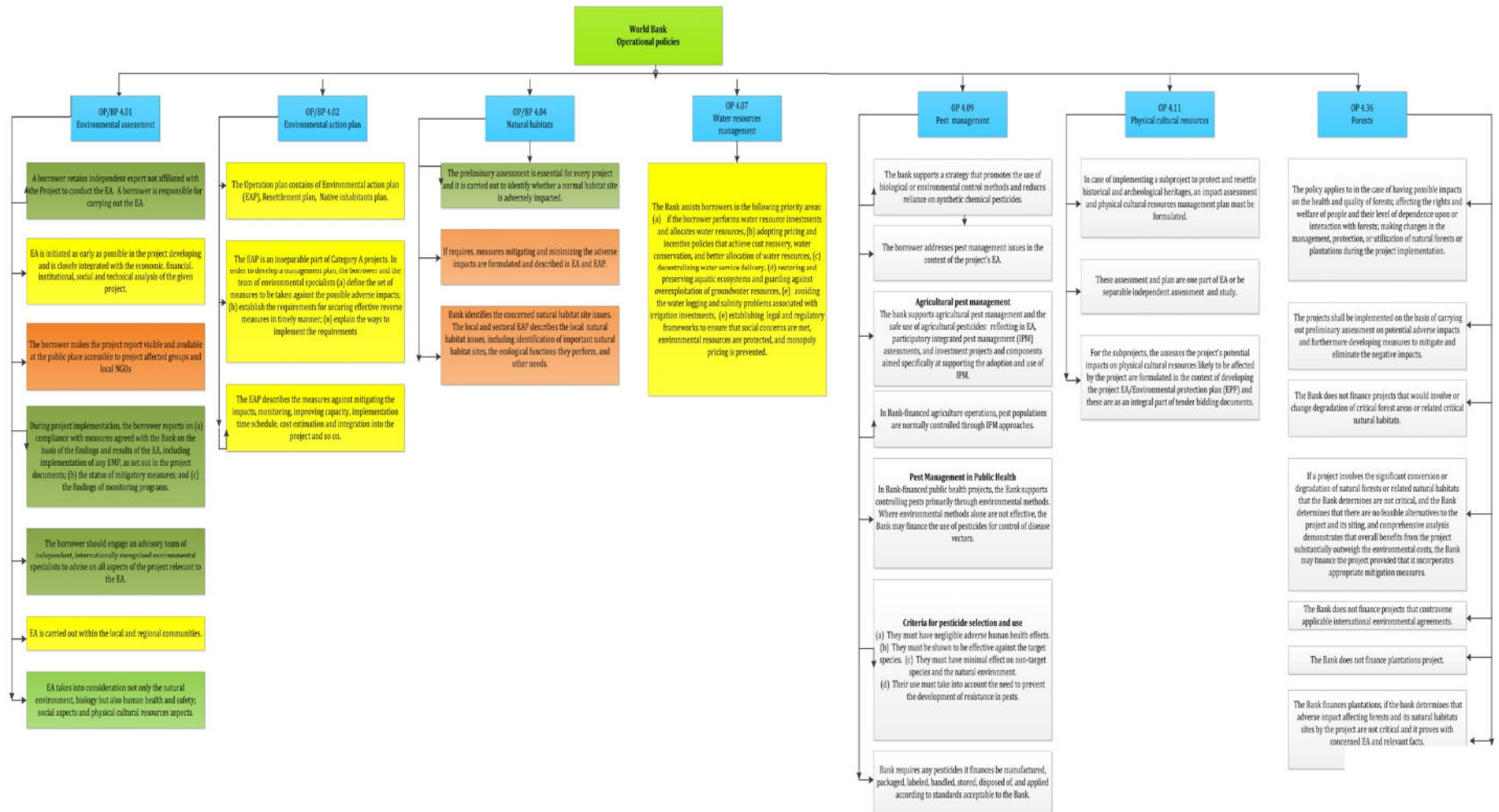


Chart 4.1. The outline of the World Bank OPs

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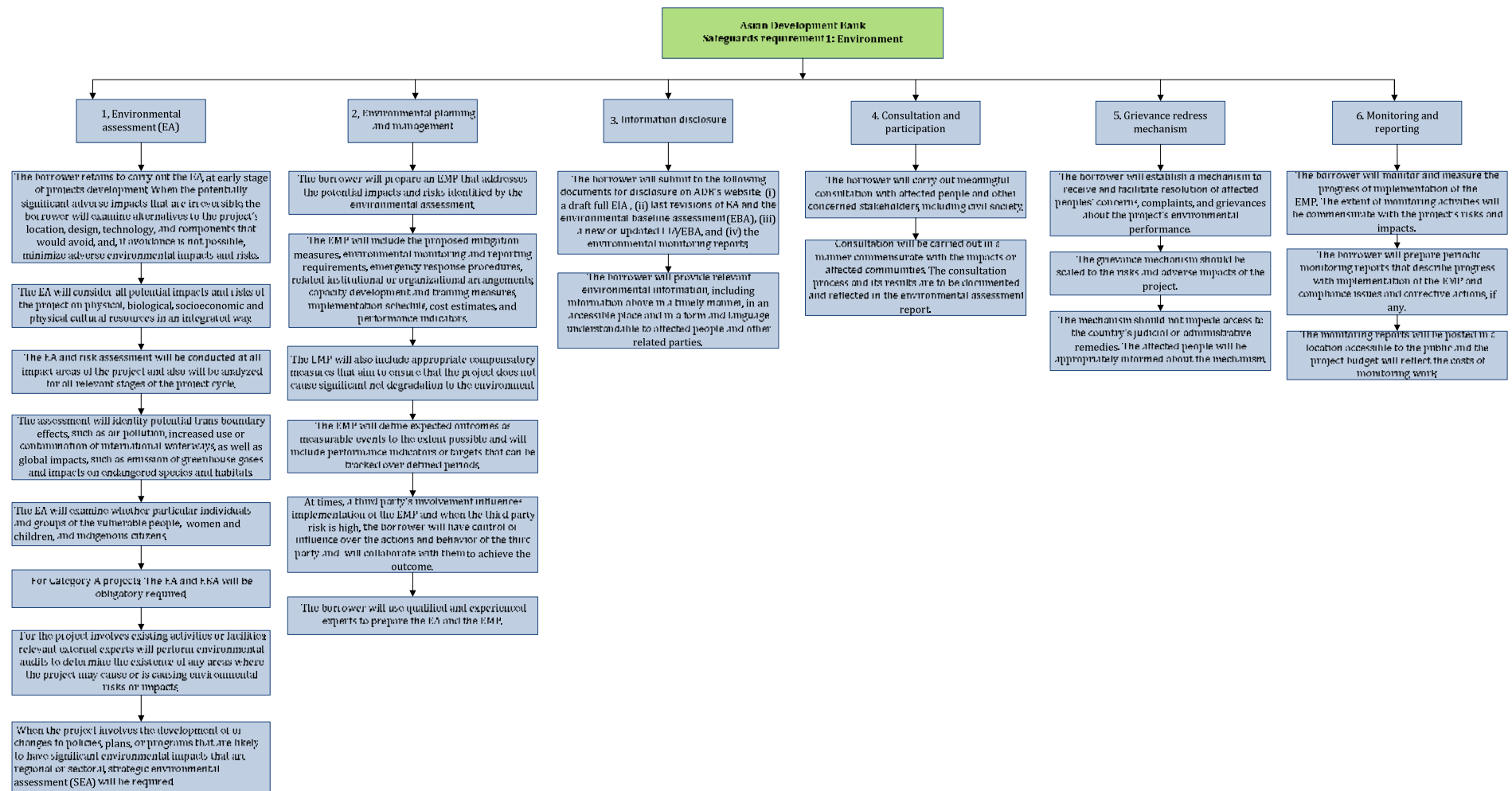


Chart 4.2. Safeguards requirements of the ADB

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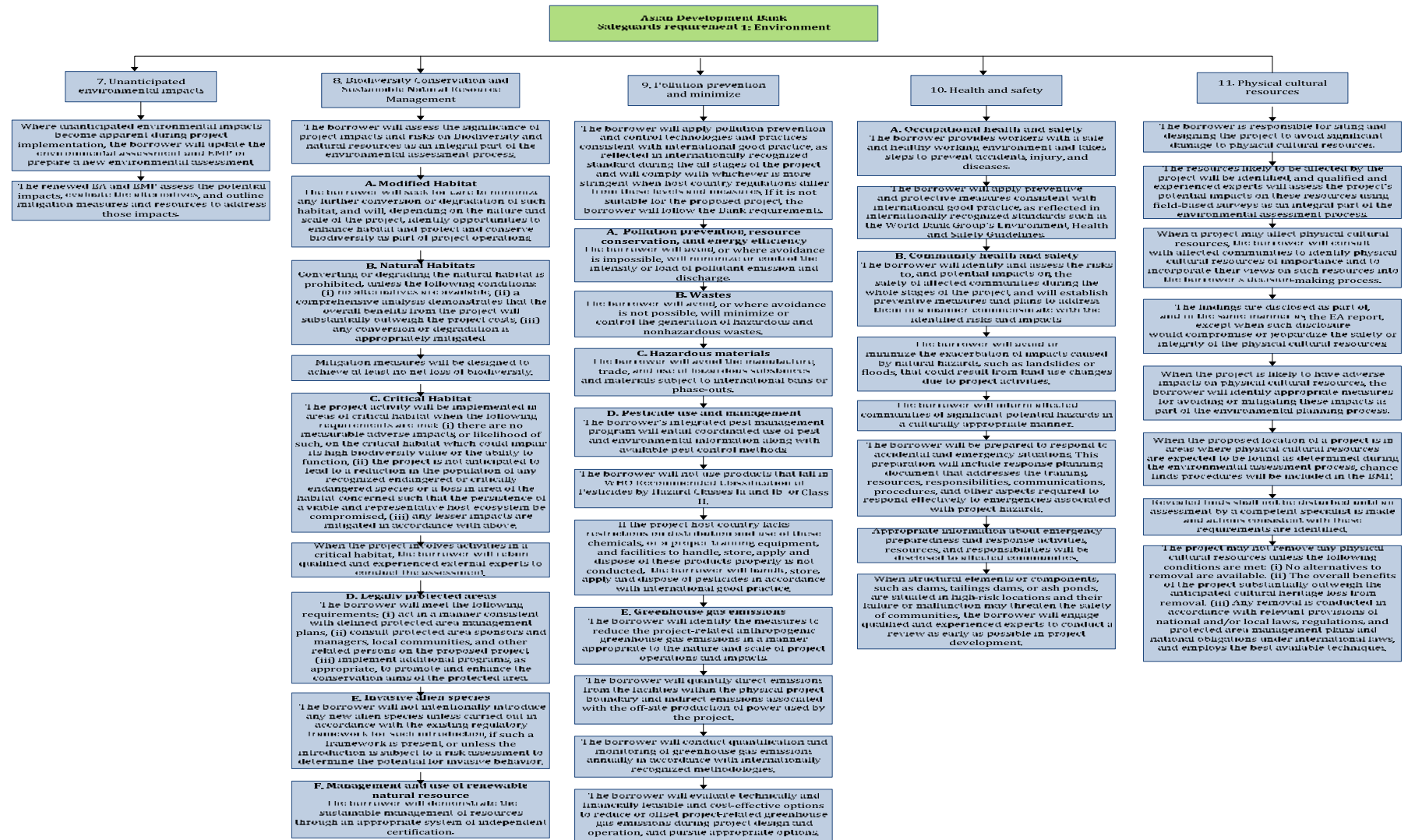


Chart 4.2. Safeguards requirements of the ADB (cont'd)

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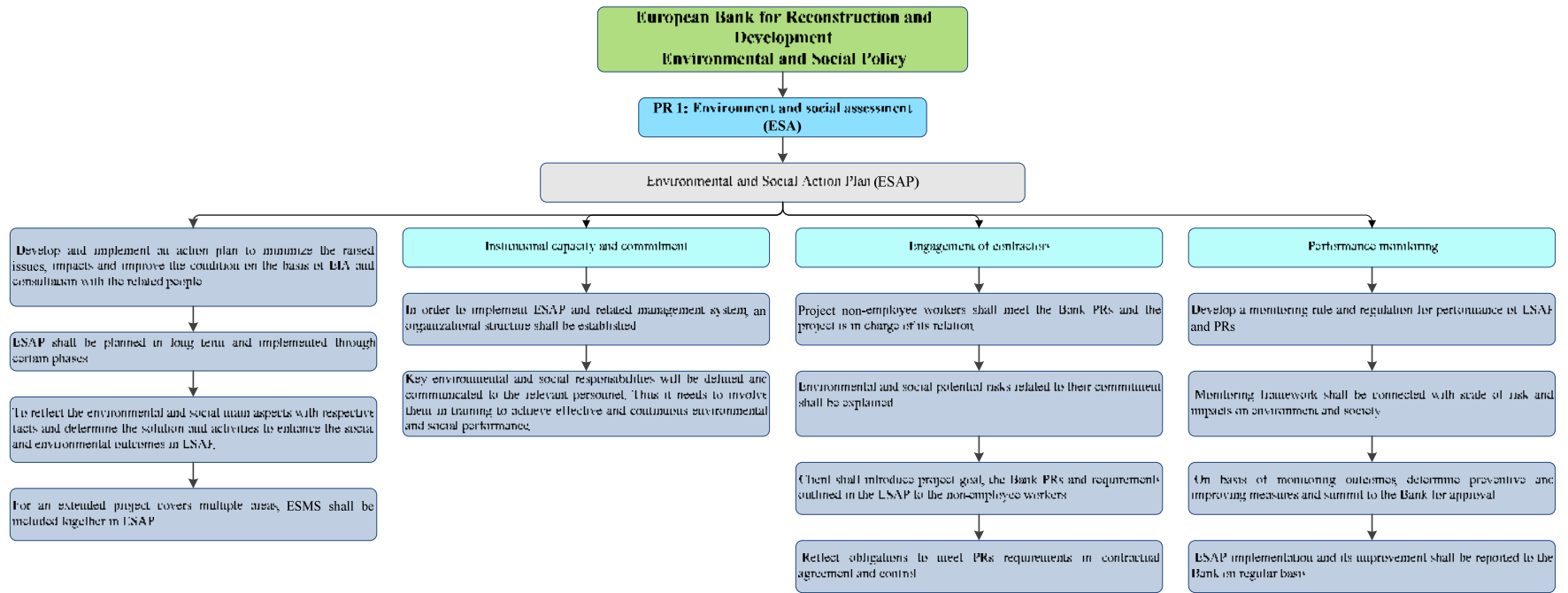


Chart 4.3. The Environmental and social policy of the EBRD

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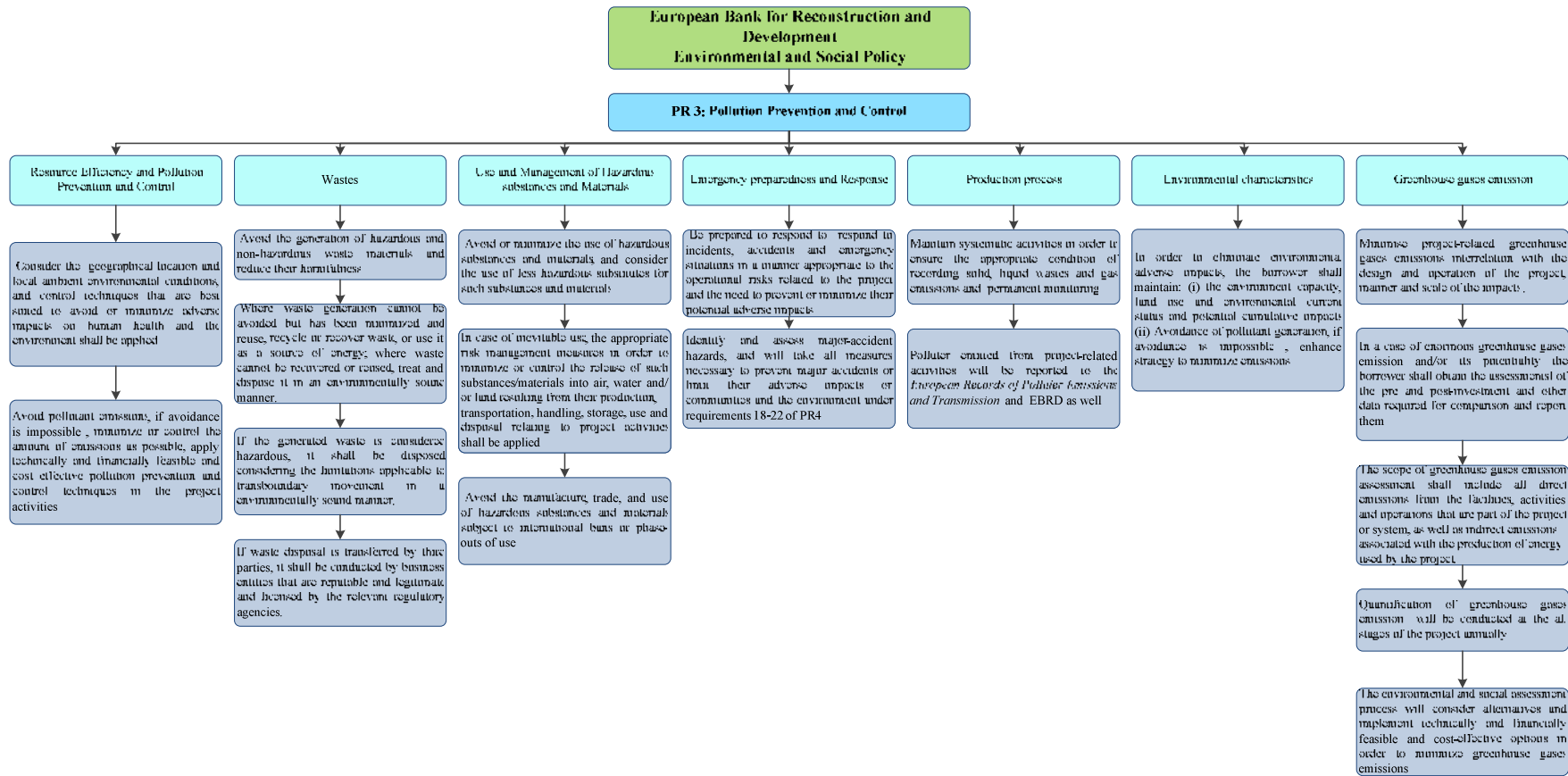


Chart 4.3. The Environmental and social policy of the EBRD (cont'd)

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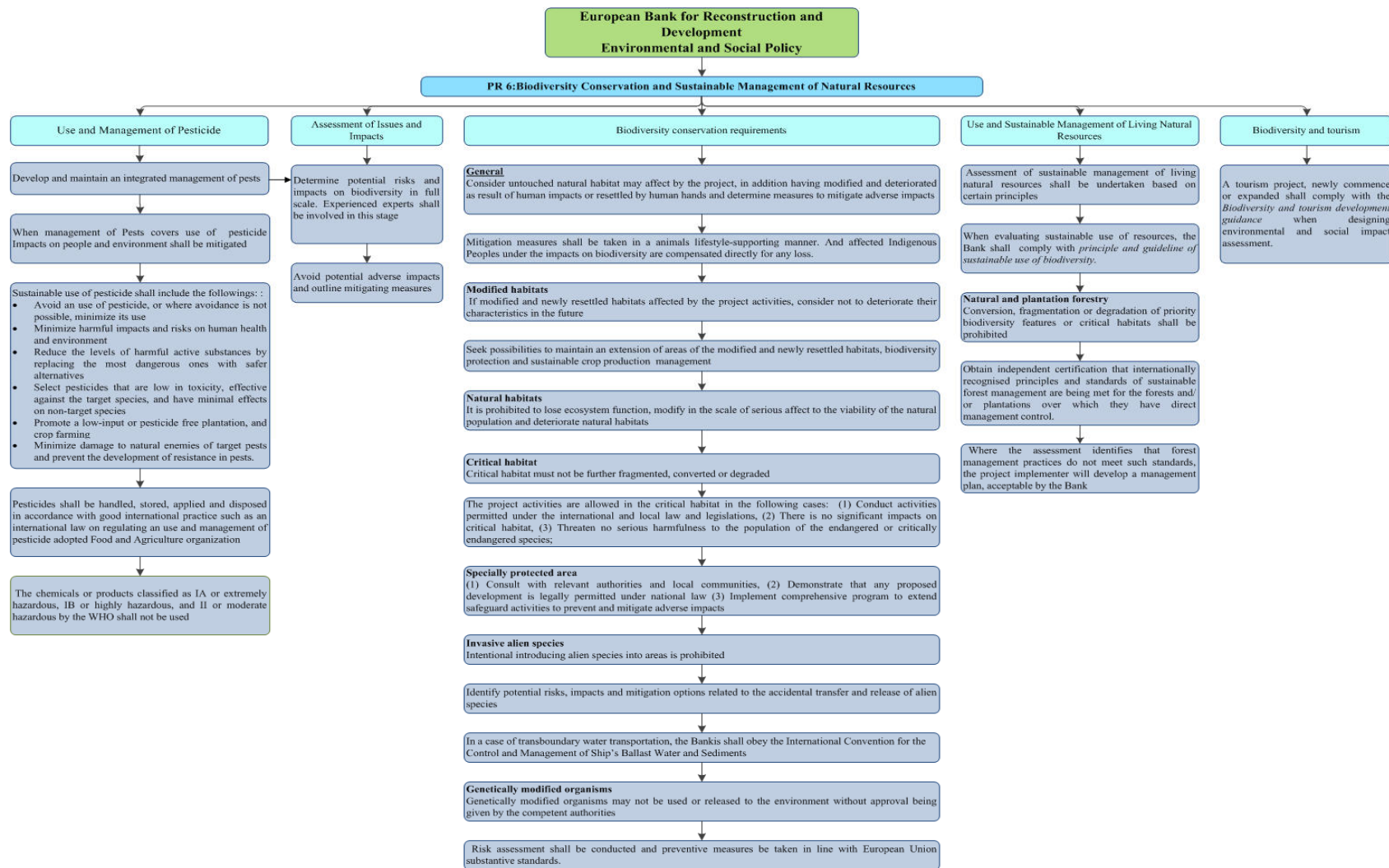


Chart 4.3. The Environmental and social policy of the EBRD (cont'd)

Asian Development Bank:

The operational policies of the Asian Development Bank (ADB) include three safeguard policies: the Environment Policy, the Policy on Indigenous Peoples and the Involuntary Resettlement Policy and they involve a structured process of impact assessment, planning, and mitigation to address the adverse effects of projects throughout the project cycle.

The safeguard policies require that (i) impacts are identified and assessed early in the project cycle; (ii) plans to avoid, minimize, mitigate, or compensate for the potential adverse impacts are developed and implemented; and (iii) affected people are informed and consulted during project preparation and implementation.

Each project are divided into the following four categorization by its type, location, scale, and the magnitude of its potential environmental impacts including direct, indirect, induced and cumulative impacts in the project's area of influence. The outline of the ADB requirements are shown in the Chart 4.2 and briefly summarised as below:

Category A:

Proposed projects are classified as Category A if it is likely to have significant adverse environmental impacts that are impossible to be rehabilitated. These impacts may affect an area broader than the sites or facilities subject to physical works. For Category A projects, developing a detailed environmental impact assessment (DEIAs) and environmental management plan is required.

Category B:

A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects.

The scope of environmental assessments for a Category B project, developing a environmental baseline assessment (EBAs) and environmental management plan (EMP) is statutory.

Category C:

A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. An environment policy is required, evethough there is no further DEIAs and EBAs action is performed For a Category C project.

Category FI:

A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary. A financial intermediary must maintain an environmental and social management policy or its business activity has to have minimal or no negative environmental impacts or no risks.

In accordance with above, the adverse impacts affecting environment and society of ETT East Tsankhi coalmine is duely classified as Category A project.

European Bank for Reconstruction and Development

The Bank classified the projects as A/B/C/FI categorizations based on (i) determination the level of environmental and social impacts, (ii) nature and level of environmental and social investigations, information disclosure and stakeholder engagement and consideration of the nature, location, sensitivity and scale of the project, and the significance of its potential adverse future environmental and social impacts. The outline of the EBRD policies are shown in the Chart 4.3 and briefly summarised as below:

A category:

Those projects are classified as “A” category that where there are potentially diverse and significant environmental impacts, which cannot be readily identified, therefore an official EIA must be prepared by the professional institution in conformity to the bank requirements.

B category:

A proposed project, which might have potential social-environmental impacts but the scale is less adverse, readily identified and measures to mitigate potential impacts can be designed is included in B category list. Impacts can be connected with past, present and future activities of the project and a requirement for assessment can be varied on a case-by-case, although it shall be developed in accordance with Performance requirements (PR) I of the EBRD.

C category:

A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. An EIA or Social Impact Assessment (SIA) is not required for this level project. In a case of unable to determine a categorization of a proposed project and lack of information to outline a framework of an assessment, EBRD specialists in charge of environment and social aspects shall undertake initial socio-environmental examination.

FI category:

A proposed project is classified as category FI if it involves the investment of EBRD funds to, or through, a financial intermediary. Prior to fund FI level project, the bank shall review and examine a project and its documentations, then make a conclusion.

EBRD requires to meet good international practices to environmental and social sustainability and in order to assist its client to achieve these; the Bank has defined and approved 10 PRs.

4.3. Performance audit on Detailed Environmental Impact Assessment recommendation

The environmental audit criteria were established using 2011, 2012, 2013 environmental management plan (EMP) followed by DEIA in 2011, ETT East Tsankhi coalmine.

The performance audit criteria was set out on the basis of choosing total 110 criteria, of which 55 from DEIA reports, 92 from EMPs by coincident counting.

There are 56 criteria for ongoing process of simultaneous implementation at the project commencement and continuous outcomes during the project implementation and 54 criteria for activities, which start within certain time after project implementation or continue during implementation and its outcomes are in place in the future.

Criteria indicators:

As seen criteria indicators, there are 64 conformances, 32 nonconformances, 6 incomplete and eight were impossible to assess. Please see the indicators by percentage in Figure 4.1.

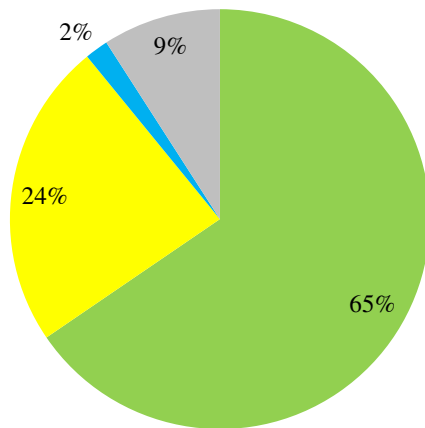


Figure 4.1: Audit indicators on Detailed Environmental Impact Assessment

As seen above data, the measures for implementation of environmental protection and avoidance of degradation and mitigation of adverse impacts for the coalmine are 65 percent and rest of them is not satisfied.

Highlighted issues:

It was observed that some requirements were not clear while examining the requirements of the DEIA and EPP.

In abovementioned requirements, the unclear ones are highlighted in yellow color. The requirements 11, 37, 67, 87 of the DEIA and the requirements 13, 15, 16, 60 of the EMP are not comprehended for people and the required measures are indefinable, thus, we concluded them as not evaluable.

Hence, a considerable consideration should be taken for implementation of the proposed advice and recommendations and should precise the activities and the plan and determine the requirements while outlining the further implementation measures.

Tasks to be implemented:

An environmental audit shall be accurately carried out within the framework of the national legislation, law, resolution of the State Great Khural and the Government decision, standard, rule and regulation pursuant to the Article 101 of the EPL. This audit was conducted only on DEIA reports, accordingly it was not considered the legal compliance audit on all above legislations.

PERFORMANCE AUDITON DEIA OF THE PROJECT FOR OPEN MINE IN EAST TSANKHI OF TAVAN TOLGOI COALMINE DEPOSIT IN TSOGTTSETSII SOUM, UMNUGOBI AIMAG

Table 4.1

№	Performance indicator 1	Report 2	Time 3	Audit 4	Evidence 5	Evaluation 6	Performance indicator 1	Evidence and argument
Mitigate adverse impacts on air quality and its audit								
1.	Improve and macadamize mine settlement area, constantly used road and vehicle stop	Report 7.6 EMP 6-2011 3.2-2012	At initial stage	Whether mine camp, road and vehicle stop are macadamized	- Photo - Work plan - Report	Conformance	The mine road on regular use and parking areas were paved.	See Appendix III. No 1-1, 1-2, 1-3
2.	In connection to weather condition, constantly keep the soil and coal transportation road moisture	Report 7.6 EMP 6-2011 3.2-2012 4.1-2013	During the project implementation	Whether coal transportation road are moistened related to weather condition	- Documentation - Work plan - Report - Photo	Conformance	Watering or water sprinkling is carried out related to weather condition.	See Appendix III. No 2-1, 2-2, 2-3, 2-4, 2-5
3.	Minimize poisonous gas through using full-fired furnace and non-smoked combustibles to heat temporary camp	Report 7.6	At initial stage	Whether full-fired furnace and non-smoked combustibles are used	- Photo - Conversation - Documentation	Conformance	The new camp was built. A resettlement was in Sep 2014. The heating was solved with electricity and floor-heating technology was used.	See Appendix III. No 3-1, 3-2
4.	Dispose household waste in short term, disinfect dumping site in certain period of time and prevent to pollute air through emitting various smell	Report 7.6 EMP 3.4-2012 4.7-2013	During the project implementation	Whether dumping site is decontaminated in certain period of time	- Work plan - Documentation - Documents on decontamination	Conformance	Waste sterilization is made.	See Appendix III. No 4-1, 4-2
5.	Prevent from steam of combustion, flammable material and oil	Report 7.6	During the project implementation	Whether preventive measures are taken against steam of combustion, flammable material and oil	- Report - Photo	Nonconformance	Protection measures from evaporation are not taken	Can be improved
6.	Infiltrate all mining machinery smoke till permitted rate	Report 7.6	At initial stage	Whether take a measure for filtering toxic smoke from machine and mechanism to the acceptable level	- Photo - Documentation - Equipment and tools	Nonconformance	Air quality measurement was conducted once with the Air Quality Agency of the Capital city (AQAC) and the report has not been prepared yet. There is no other measures, taken	Can be improved
7.	Test an air sample in certain period of time, determine air pollution rate and take related measures	Report 7.6 EMEP 7.1-2011 5.1-2013	During the project implementation	Whether air sample are tested in certain period of time, air pollution rate is determined and measures are taken	- Documentation - Research result - Report	Conformance	Air dust falls are measured at 7 points, but there is no quality classification on them.	See Appendix III. No 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 7-7, 7-8, 7-9, 7-10, 7-11, 7-12

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8.	Constantly monitor dust emission rate along road and implement measures to minimize dust generation negative impact	Report 7.6 EMP 3.2-2013	During the project implementation	Whether dust emission rate along road is monitored and measures to minimize dust generation negative impact are taken	- Documentation - Research report - Monitoring registration	Unassessable	A measurement was conducted once by the AQAC and the examination findings and report have not been received yet.	Can be improved
9.	Observe dust level in mining area and take samplings at work place and test them	Report 7.6	During the project implementation	Whether dust level in mining area is observed and sampling at work place is tested on a regular basis	- Report - Research result - Equipment - Photo	Nonconformance	Dust measurement at the work place has not been conducted yet.	Can be improved
10.	Determine land vibration, shake and air overpressure	Report 7.6	During the project implementation	Whether land vibration and air overpressure are determined	- Documentation - Conversation	Nonconformance	Shock, vibration and air overpressure are not determined.	Can be improved
11.	Check dust with naked eyes during blasting operation	Report 7.6	During the project implementation	Whether dust is checked with naked eyes during blasting operation	- Documentation - Conversation - Photo	Unassessable	Clarify the company who undertook the DEIA	Can be improved
12.	Obey blasting techniques and safety rule during blasting for securing people and animals' safety	Report 7.6	During the project implementation	Whether work due to blasting technique and safety rule	- Conversation - Photo	Conformance	The rule and regulations for blasting period is adhered on work.	See Appendix III. No 12-1, 12-2, 12-3, 12-4, 12-5, 12-6, 12-7, 12-8, 12-9, 12-10, 12-11
13.	Take an appropriate measure on the basis of the results of dust generation and toxic gas within the air quality monitoring	EPM 6-2011	During the project implementation	Whether air quality is monitored	- Work plan - Documentation - Research result - Photo	Conformance	There are 7 dust generation points and wind protection fencing to minimize its power is being installed.	See Appendix III. No 13-1, 13-2, 13-3, 13-4, 13-5
14.	To water land along the road and control vehicle's speed to minimize environmental dust generation	EMP 6-2011	During the project implementation	Whether dust generation is reduced and vehicle traffic is controlled	- Photo - Conversation - Work plan	Conformance	Maintain watering of roads in order to minimize dust.	See Appendix III. No 14-1, 14-2, 14-3
15.	Use and test dust suppression chemical substances	EMP 6-2011	At Initial stage	Whether watering and dust suppression chemical substances are used	- Photo - Conversation - Documentation	Nonconformance	Chemical substances have not tested	Specific research and testing
16.	Commence a green building plantation protecting against wind	EMP 6-2011	At initial stage	Whether green building plantation protecting against wind is commenced	- Photo - Conversation - Work plan	Conformance	Wind protection fencing has been installed and green development has started.	See Appendix III. No 16-1, 16-2, 16-3, 16-4
17.	Provide mine employees with protective equipment from dust	EMP 3.2-2012 4.1-2013	At initial stage	Whether dust protective equipment is provided to mine employees	- Photo - Conversation	Conformance	Three kinds of masks were distributed to the employees.	See Appendix III. No 17-1, 17-2
18.	Cohered blasting with weather condition	Report 7.6 EMP 6-2011 3.2-2012 4.1-2013	During the project implementation	Whether blasting is cohered weather condition	- Photo - Work plan - Documentation	Conformance	It was specified in the safety regulation during blasting.	See Appendix III. No 18-1, 18-2, 18-3, 18-4, 18-5, 18-6
19.	Monitor noise and vibration near local citizens settlement area and develop detailed plan on the basis of the result	EMP 6-2011	At initial stage	Whether noise and vibration near local citizens housing area are observed and detailed plan is developed on the basis of the result	- Conversation - Work plan	Nonconformance	No control	Can be improved

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20.	To build wind fencing protection in coal loading and unloading area of Tsagaan Khad's customs warehouse	EMP 4.1-2013	During the project implementation	Whether wind fencing protection in coal loading and unloading area is built	- Photo - Material type	Nonconformance	Wind protection fencing has not been installed	Can be improved
21.	Conduct a study on road dust emissions from Tsagaan Khad to the border point by foreign professional organization	EMP 4.1-2013	During the project implementation	Whether a study on road dust emissions from Tsagaan Khad to the border point is conducted by foreign professional organization	- Documentation - Conversation - Photo	Nonconformance	No measurement or study	Can be improved
Mitigate adverse impacts on soil and its audit								
22.	Monitor and implement measure to protect soil from household waste and oil products pollution	Report 7.6	During the project implementation	Whether measure to protect soil against household waste and oil products pollution is overseen and taken	- Work plan - Conversation	Conformance	Soil protection blanket was underlain where necessary.	
23.	Prevent from soil degradation through developing lot of diverted roads and set up road sign	Report 7.6 EMP 2012 4.2-2013	At initial stage	Whether prevent from soil degradation through making lot of diverted roads and a measure to set up road signs is taken	- Photo - Conversation - Documentation	Conformance	Roads and ways are marked and the special road was designated.	See Appendix III. No 23-1, 23-2
24.	Implement a plan to reclamation soil, cultivate plants and shrubs near camp and mine site	Report 7.6	During the project implementation	Whether plants and shrubs are cultivated near camp and mine site	- Work plan - Photo - Conversation	Conformance	The green development work has commenced in the areas of surrounding the work place and mine.	See Appendix III. No 24-1, 24-2, 24-3
25.	Dump fertile soil, is to be likely affected top soil stripping operation separately and use them in biological rehabilitation	Report 7.6	During the project implementation	Whether fertile soil, that stripped off is dumped separately and used in biological rehabilitation	- Work plan - Photo - Conversation	Conformance	Topsoil stockpiling has been performed separately.	See Appendix III. No 25-1, 25-2, 25-3, 25-4
26.	Dump soil properly according to a mining plan	Report 7.6	At initial stage	Whether soil dump is done according to mining plan	- Work plan - Photo	Conformance	The stockpiling is formed in accordance with the Mine plan.	See Appendix III. No 26-1, 26-2, 26-3
27.	Store soil dump according to mineral surveyor design	Report 7.6	At initial stage	Whether soil dump is stored according to mineral surveyor design	- Photo - Conversation	Conformance	The stockpiling is formed in accordance with what specified in the design drawing.	See Appendix III. No 27-1
28.	Soil dump has not to be carried and not to be covered during operation	Report 7.6	During the project implementation	Whether requirement of not carrying and covering dump is met during operation	- Photo - Conversation	Conformance	The soil stockpiling has been formed in the manner of none replacement.	
29.	A dump should be in a smaller site, in a condition of not corrupting the natural scene, producing less dust as possible and suitable to do technical rehabilitation.	Report 7.6	At initial stage	Whether dump is placed in a small area based on consideration the conditions of less dust emissions, not corrupting the natural scene, as possible and suitable to do technical rehabilitation.	- Photo - Report - Work plan	Conformance	The stockpiling is formed in a convenient way to reclaim	See Appendix III. No 29-1, 29-2
30.	Build dams and canals to protect operation site from flooding water	Report 7.6 EMP 6-2011	At initial stage	Whether dams and canals to protect operation site from flooding water are built	- Photo - Report - Work plan	Conformance	Flood prevention dams are constructed.	See Appendix III. No 30-1, 30-2, 30-3
31.	Do a soil test by professional organizations, take related measures on a regular basis	Report 7.6 EMEP 7.2-2011 4.3-2012	During the project implementation	Whether soil test is done by professional organizations and related measures are taken	- Work plan - Research result	Conformance	Soil tests are conducted but follow up measures upon the results have not been taken.	See Appendix III. No 31-1, 31-2, 31-3, 31-4, 31-5, 31-6, 31-7, 31-8

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		5.3-2013						
32.	Do not to develop a new road to minimize impact on soil erosion during coal transportation	Report 7.6	At initial stage	Whether a measure is taken not to develop new road for minimizing adverse impact on soil erosion during coal transportation	- Conversation - Documentation	Nonconformance	Transporting coals through some unpaved roads because of overload of the coal transportation trucks caused dust and soil erosion.	 Serious nonconformance
33.	If necessary, pay a road fee to the local authorities	Report 7.6	During the project implementation	Whether a road fee is paid to the local authorities	- Documentation	Conformance	Coal is transported on the roads, where the local TT obtained the permit.	
34.	Approve to coal transportation road routine as negotiating with local authorities	Report 7.6	During the project implementation	Whether coal transportation road routine is approved based on negotiation with local authorities	- Documentation	Conformance	Coal is transported on the roads, where the local TT obtained the permit	
35.	Specify the requirements of long-term soil storage on mining plan	Report 7.6	At initial stage	Whether requirements of long-term soil storage are reflected on mining plan	- Documentation - Conversation	Conformance	It is specified in the Mine plan.	See Appendix III. No 35-1, 35-2
36.	Transport, cover, and flatten rich fertile and fertile soil in the leveled, sloped and formed area	Report 7.6	During the project implementation	Whether rich fertile and fertile soil on prepared areas are carried, covered and flattened	- Documentation - Conversation - Photo	Unassessable	It is not a due time to commence remediation	
37.	Cultivate all formed areas and reclamate soil according to care management system	Report 7.6	During the project implementation	Whether a plan for cultivation the all formed areas and rehabilitation according to care management system	- Work plan	Unassessable	It is not a due time to commence remediation	
38.	Replace fertile soil from operation site, reuse soil in biological rehabilitation and use it as plantation for pasture and crop farming to prevent fertile soil from disinfection	Report 7.6	During the project implementation	Whether fertile soil of operation site is replaced, soil in biological rehabilitation is reused and soil is used as plantation for pasture and crop farming to prevent fertile soil from disinfection	- Work plan - Photo	Unassessable	The location of topsoil stockpiling is improper and it was placed in lee side: This type of tasks have not been planned yet.	
39.	Develop mining closure plan	Report 7.6	During the project implementation	Whether mining closure plan is developed	- Work plan	Nonconformance	A mine closure plan has not been designed.	Serious nonconformance
40.	Focus on degrading less scale area and plan the operation in detail	EMP 6-2011	During the project implementation	Whether to focus on degrading less scale area and develop an operation plan	- Work plan - Report	Conformance	Measure to get a permit for earthwork commencement is taken.	See Appendix III. No 40-1, 40-2
41.	Do not increase land area used for construction foundation, if not necessarily required.	EMP 6-2011	During the project implementation	Whether a measure for not increasing land area used for construction foundation is taken	- Report - Documentation	Conformance	Temporary facility or sandwich building has been constructed.	See Appendix III. No 41-1, 41-2
42.	Macadamize loose soil area	EMP 6-2011	During the project implementation	Whether loose soil area is macadamized	- Photo - Report	Conformance	Gravel layer is installed.	See Appendix III. No 42-1, 42-2, 42-3
43.	Take measures for separate storage and mitigating contaminated soil and making a bed with water proof layer and reuse them	EMP 6-2011	During the project implementation	Whether contaminated soil is stored separately, mitigated and reused them	- Documentation - Equipment and tools - Photo	Conformance	The special area was designated to neutralize the contaminated soil.	See Appendix III. No 43-1, 43-2, 43-3, 43-4
44.	Supervise activities of the entities and citizens running operation within licensed area, take measures to minimize and eliminate soil erosion, degradation and contamination	EMP 4.2-2013		Whether control land use	- Report - Documentation - Conversation	Conformance	Some measures are taken by the company.	See Appendix III. No 44-1, 44-2, 44-3, 44-4, 44-5

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	affected by their wrong activities with soum environmental protection division and professional team and consider their outcomes.		During the project implementation					
45.	Travelling heavy trucks and machine techniques are only allowed on the certain road	EMP 3.5-2012 4.2-2013	At initial stage	Whether oversee traffic	- Photo - Work plan	Conformance	The internal regulation on working in mine is extremely good.	See Appendix III. No 45-1, 45-2, 45-3
46.	Replace soil dump estimating wind flow and geographical location and control its implementation	EMP 6-2011 3.5-2012 4.2-2013	At initial stage	Whether soil dump is replaced based on estimation of wind flow and geographical location	- Work - Conversation - Photo	Conformance	Soil stockpiling is under control.	
Mitigate adverse impacts on water management and its audit								
47.	To build groundwater monitoring well near mine and observe groundwater level change	Report 7.6 EMP 3.3-2012 4.3-2013	At initial stage	Whether groundwater monitoring well near mine is built and groundwater level change is controlled	- Photo - Documentation	Conformance	There are 2 monitoring points and the level of groundwater is measured.	See Appendix III. No 47-1, 47-2, 47-3, 47-4, 47-5
48.	Study and enhance the possibility of efficient use water seepage from mining	Report 7.6	At initial stage	Whether possibility to use the mining water seepage or reject water is studied and related measures are taking accordingly	- Report - Documentation	Conformance	Seepage water is accumulated in the sumps and it used for watering to minimize dust generation of roads.	See Appendix III. No 48-1, 48-2
49.	Use the mining water seepage for road watering and biological rehabilitation	Report 7.6	During the project implementation	Whether leaking water is used for road watering and biological rehabilitation	- Photo - Conversation	Conformance	Seepage water is accumulated in the sumps and it used for watering.	See Appendix III. No 49-1
50.	Take a measure and test drinking water in accordance with drinking water standard	Report 7.6 EMP 3.3-2012	At initial stage	Whether drinking water is met with the standard	- Research result - Report	Conformance	Water quality monitoring is carried out, although softening measures for groundwater with potable standards have not been taken.	See Appendix III. No 50-1, 50-2, 50-3, 50-4, 50-5, 50-6, 50-7, 50-8, 50-9, 50-10, 50-11, 50-12, 50-13
51.	Constantly keep the mine water seepage and dewater soil and mining benches	EMP 6-2011	During the project implementation	Whether keep mine water seepage and soil and mine bench are dewatered	- Work plan - Documentation - Photo	Conformance	Seepage water is accumulated in the sump in accordance with the requirement underlined in the mining general requirements.	See Appendix III. No 51-1, 51-2, 51-3
52.	Discharge the disinfected water and clean out the well and facilities after raining	EMP 6-2011	During the project implementation	Whether well and facilities are constantly cleaned out after raining and disinfected water is discharged	- Conversion - Documentation	Conformance	It is cleaned when it rains.	See Appendix III. No 52-1
53.	Build dams and sump for collecting groundwater and water flow after rain	EMP 6-2011	At initial project stage	Whether water collecting sump is built	- Photo - Report	Nonconformance	A study on water flow of the rainfall has not been conducted and artificial water reservoir has not been built so far.	Can be improved
54.	Secure and check sewage pipeline, system underground sewage well and water tanks in proper condition	EMP 6-2011	During the project implementation	Whether sewage pipeline, sewage system, underground sewage well and water tanks are checked	- Documentation - Report - Photo	Nonconformance	Control has not been accomplished since the installation	Can be improved

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55.	Introduce water recycling and conservation technology	EMP 6-2011	At initial stage	Whether water is recycled	- Documentation - Work plan	Nonconformance	The technology has not been introduced.	Serious nonconformance
56.	Build water monitoring wells in the tailing dam and reclaim pond and to control groundwater resource and its quality	EMP 6-2011	At initial stage	Whether water monitoring wells are built and the water resource and its quality are assured	- Documentation - Check sheet	Conformance	There are 2 monitoring points. Water resources control is accomplished. However, water quality control is not conducted. Evidence:	See Appendix III. No 56-1, 56-2, 56-3, 56-4, 56-5
57.	Install calculator at water points	EMP 2012	At initial stage	Whether water calculator is installed	- Photo - Report	Conformance	Water meters have been installed in the water points.	See Appendix III. No 57-1, 57-2, 57-3, 57-4
58.	Focus on not changing surface water flow and build drainage system on the road and necessary points in the area	EMP 6-2011 4.4-2013	At initial stage	Whether drainage system on the road and necessary points is built	- Work plan - Documentation - Photo	Conformance	Drainage trenches have been newly installed.	See Appendix III. No 58-1, 58-2, 58-3, 58-4
59.	Implement a detailed water monitoring program	EMP 4.3-2013	At initial stage	Whether the detailed water monitoring program is implemented	- Research result	Conformance	2 monitoring points have been installed, a detailed program of water control and monitoring has not been designed.	See Appendix III. No 59-1, 59-2
60.	Protect against flood through changing flood flow direction and prevent from carrying pollution from mine site	EMP 3.3-2012	At initial stage	Whether measures for protecting against flood through changing flood flow direction outside of mining area and preventing from carrying pollution from mine site	- Report - Photo	Nonconformance	A study on water flow of the rainfall has not been conducted.	Can be improved
61.	Monitoring well in affected region near the project site and register and restore water level fluctuation	EMP 6-2011 4.3-2013	At initial stage	Whether well in the affected region near the project site is controlled	- Registration sheet - Documentation - Report	Conformance	The wells in the impact zones are under control.	See Appendix III. No 61-1, 61-2, 61-3, 61-4, 61-5, 61-6
Mitigate adverse impacts caused by wastes and its audit								
62.	Control industrial waste from the mine on a regular basis and develop and implement a waste management	Report 7.6	At initial stage	Whether a constant control over industrial waste is put	- Documentation - Photo	Incomplete	The company has the waste control. The management plan has not been developed.	Can be improved
63.	Determine waste source and flows and segregate toxic and non-toxic waste	Report 7.6	At initial stage	Whether waste source and flows are determined and wastes are segregated toxic and non-toxic waste	- Documentation	Nonconformance	Wastes are not classified as hazardous or non-hazardous	Serious nonconformance
64.	Register waste sources and flows, clarified above and determine possibility of reuse and recycling	Report 7.6 EMP 6-2011	At initial stage	Whether waste sources and flows, clarified above are registered and possibility of reuse and recycling is determined	- Documentation - Photo	Conformance	Wastes are classified as a general, re-usable and recycling.	
65.	Implement further policy of waste management on the basis of registration and study	Report 7.6	During the project implementation	Whether further policy of waste management is implemented	- Documentation	Nonconformance	The waste study has not been conducted	Can be improved
66.	Develop and implement a project for rehabilitation of old dumping site	Report 7.6	During the project implementation	Whether project for old dumping site rehabilitation is developed and implemented	- Photo - Report	Nonconformance	Such projects was not implemented	Can be improved

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67.	Transport solid waste in short term and bury it in soil dump	Report 7.6	During the project implementation	Whether solid waste is transported in short term and it is buried in soil dump	- Photo - Conversation - Documentation	Unassessable	The provisions of the DEIA are not clear	
68.	Comply with the waste management rule and regulations of ETT and operate with developing plan and programs of waste scale reduction and waste disposal on the basis of safe way	EMP 6-2011 3.4-2012	At initial stage	Whether waste management rule and regulations is enforced and plan and programs of waste scale reduction and waste disposal on the basis of safe way are developed	- Work plan - Report	Conformance	There are waste collection, storage, and transportation and disposal procedures.	See Appendix III. No 68-1, 68-2
69.	Place colored and signed bins at required points	EMP 3.4-2012	At initial stage	Whether colored and signed bins are placed at required points	- Photo - Report	Conformance	Waste bins are positioned in the areas where need.	See Appendix III. No 69-1, 69-2
70.	Establish temporarily solid waste yard including medical waste disposal /obtain permit from soum governor/	EMP 3.4-2012 4.7-2013	At initial stage	Whether temporarily solid dumping site including medical waste disposal is established	- Official letter - Disposal document - Photo - Report	Conformance	Temporary disposal waste point was designed.	See Appendix III. No 70-1, 70-2, 70-3
71.	Control over chemical substance residue, waste and waste disposal methods	EMP 6-2011	At initial stage	Whether chemical substance residue and wastes are disposed	- Photo - Report - Disposal document	Conformance	The wastes are disposed by the incineration process.	See Appendix III. No 71-1, 71-2
72.	Store substance in furnished warehouse and area in accordance with SDS	EMP 6-2011	At initial stage	Whether substance is stored in furnished warehouse and area in accordance with SDS	- Report - Photo	Nonconformance	There is a hazardous material store because the Contractor has executed the relevant works.	Can be improved See Appendix III. No 72-1
73.	Constant control over chemical storage and utilization	EMP 6-2011	At initial stage	Whether chemical storage and utilization are controlled	- Report - Registration	Nonconformance	Control procedure is poor and there are no signs.	Serious nonconformance
74.	Place enough absorb spill substance and material to high risk occupations for spill	EMP 6-2011	At initial stage	Whether enough absorb spill substance and material are replaced to high risk occupations for spill	- Report - Photo - Documentation	Nonconformance	It did not completely cover the necessary areas and there is direct oil spillage on the soil.	Serious nonconformance See Appendix III. No 74-1, 74-2, 74-3
75.	Prevent from spill, develop internal procedures during spill and train employees for spill	EMP 6-2011	At initial stage	Whether preventing from spill, internal procedures during spill are developed	- Report - Documentation - Conversation	Conformance	There is a spillage procedure.	See Appendix III. No 75-1, 75-2
76.	Perform machinery maintenance in only designated repair point and area	EMP 6-2011	At initial stage	Whether machinery maintenance is performed in only designated repair point and area	- Photo - Report	Conformance	There is a repair shop facility but in where it is impossible to contain the large techniques and equipment. Then the maintenance and service is conducted outdoor.	See Appendix III. No 76-1, 76-2, 76-3, 76-4
77.	Pave a fuel tank or dispenser area, where spill may occur or to build a temporary facility collecting fuel spills	EMP 6-2011	At initial stage	Whether a fuel tank or dispenser area, where spill may occur is paved or a temporary facility collecting fuel spills is built	- Report - Photo - Documentation	Conformance	The blanket layer was covered in the Fuel station area.	See Appendix III. No 77-1, 77-2, 77-3

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78.	Get approval from an expert in charge of environment, prior making an order of all chemical substance	EMP 6-2011	At initial stage	Whether all chemical substance orders are checked and approved by expert in charge of environment are controlled	- Report - Conversation	Nonconformance	The environmental specialists have no records on chemical substances	Serious nonconformance
79.	Appropriate tags, label and signs including caution on chemical substance package are required	EMP 6-2011	At initial stage	Whether there are appropriate tag, label and signs including caution on chemical substance package	- Report - Photo	Nonconformance	There no signs on the substances, are being used	Serious nonconformance
80.	Store separately inconsistent substances or substance that is impossible to keep together	EMP 6-2011	At initial stage	Whether inconsistent substances are stored separately	- Report - Documentation	Conformance	The contractor is performed.	See Appendix III. No 80-1
81.	Store and keep all chemical substances especially flammable and combustible liquids away from heating equipment system and direct sunlight and in flood water free places	EMP 6-2011	At initial stage	Whether all chemical substances especially flammable and combustible liquids are stored away from heating equipment system and direct sunlight and in flood water free places	- Report - Documentation	Conformance	Stores in the special containers away from the sunlight.	See Appendix III. No 81-1, 81-2
82.	Determine waste disposal area at the site and replace a certain type of bins suitable for the wastes in that area	EMP 4.7-2013	At initial stage	Whether waste disposal area is determined and different bins are replaced for its need	- Photo - Report	Conformance	The waste points are designed in accordance with the classification.	See Appendix III. No 82-1, 82-2, 82-3, 82-4, 82-5, 82-6, 82-7, 82-8, 82-9
83.	Clear out household wastes around the waste disposal area at operational site and remove them to the disposal area	EMP 4.2-2013	At initial stage	Whether household waste around the waste disposal area at the operational site is cleared out and removed to the disposal area.	- Report - Photo	Conformance	Waste treatment/ cleansing plan has been developed.	See Appendix III. No 83-1
84.	Properly store solid and liquid wastes from mine site and housing at the special point and clear out, disinfect and remove them on a regular basis	EMP 3.5-2012 4.2-2013	At initial stage	Whether solid and liquid wastes from mine site and housing are stored at the special point and clear out, disinfection and removal works are performed on a regular basis	- Photo - Disinfecting document	Conformance	Household wastes are collected in special point and are sterilized and cleared out.	See Appendix III. No 84-1, 84-2, 84-3, 84-4, 84-5
85.	Store flammable lubricant materials in special container, prevent from spill, develop a plan to collect, clear out and reuse the wastes and take a measure to remove infected soil	EMP 3.5-2012 4.2-2013	At initial stage	Whether flammable lubricant materials are stored in special container and be prevented from spill	- Report - Photo	Nonconformance	The lubricating materials have been spilled. The control over it is poor.	See Appendix III. No85-1, 85-2, 85-3, 85-4

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86.	Supply the wastes as raw material in a recycling industry through accumulating used oil and lubes from the repair shop	EMP 4.2-2013	At initial stage	Whether the used oil, lube wastes are supplied to the recycling industry through accumulating them from the repair shop	- Photo - Report - Documentation	Conformance	The oil and lubricants used in the repair shop are accumulated and are supplied to the Contractor company.	See Appendix III. No 86-1, 86-2, 86-3, 86-4, 86-5, 86-6
Mitigate impacts on biodiversity and its audit								
87.	A main method to protect plant covers from the adverse impacts during mining (blasting, loading and unloading process and transportation) is not to spread various chemical dust to surrounding environment. In addition to establish the road routines in proper ways and control them.	Report 7.6	During the project implementation	Whether measures for protecting plants from adverse impact are taken	- Work plan - Documentation - Conversation - Road route	Unassessable	The provisions of the DEIA is unclear	
88.	Actively mobilize professional organizations and the environmental teams to perform cultivation and plantation at appropriate period in accordance with relevant technology, standards, norms, measures and agrological care	Report 7.6	During the project implementation	Whether cultivation and plantation are performed in accordance with relevant technology and standards	- Work plan - Documentation - Conversation - Road route	Conformance	Natural plant research was carried out and related training was conducted among the specialists.	
89.	Germinate plants from seeds, roots, basal shoots, bulbs and sprouting bulbs, branches, control the planting speed on weekly and monthly basis. Evaluate plant adaptation, winterization habit and regrowth and get assistance from professional bodies and specialists	Report 7.6	During the project implementation	Whether control the planting speed on weekly and monthly basis and evaluate plant adaptation, winterization habit and regrowth	- Monitoring result - Conversation - Photo	Conformance	Maintained cooperation with the professional institution.	See Appendix III. No 89-1, 89-2
90.	Protect rare and extremely rare plants, complete construction of greenhouse and tree living fence, a main point for commencing tests and survey for efficient biological rehabilitation in gobi desert condition	EMP 6-2011 4.4-2013	During the project implementation	Whether rare and extremely rare plants are protected, a study for plant in gobi desert is commenced, a tree living fence is built	- Photo - Document type - Study process	Conformance	Experiment and research on using natural plant in reclamation process has started.	See Appendix III. No 90-1, 90-2, 90-3, 90-4, 90-5, 90-6, 90-7
Reclamation and Mine closure and their audit								
91.	Reflect a restoration of soil degradation and erosion near mine in annual environmental reclamation plan and implement them pursuant to the plan	Report 7.6	During the project implementation	Whether restoration of soil degradation and erosion near mine is reflected in annual environmental reclamation plan	- Report - Documentation	Conformance	Reclamation is carried out in each case and handed over as specified in the EMP.	See Appendix III. No 91-1, 91-2, 91-3, 91-4, 91-5, 91-5, 91-6, 91-7, 91-8, 91-9 91-10

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92.	Apply technical and biological reclamation for the degradation land during the mining operation into the land available for use as pastureland	Report 7.6 EMP -2012	During the project implementation	Whether technical and biological reclamation is applied for the degradation land during the mining operation into the land available for use as pastureland	- Photo - QA document	Unassessable	The planned period has been postponed, even though it was reflected in the EMP.	Can be improved
93.	Enforce to develop and perform a land formation design for technical and biological reclamation of outer dump	Report 7.6	During the project implementation	Whether dump formation design is developed	- Work plan - Photo	Conformance	It was reflected in the Project general plan.	
94.	Prevent from habitat destruction or landscape change and migration of inhabitants	Report 7.6	During the project implementation	Whether measures for preventing destruction of nature or landscape change and habitat migration	- Work plan	Nonconformance	This type of work has not been done	Can be improved
95.	Reuse and cultivate gobi regional plant in some potential regeneration area with intention	Report 7.6	During the project implementation	Whether gobi regional plant is reused and cultivated on purpose	- Work plan - Photo	Conformance	Sowing plants of Gobi region has been started.	See Appendix III. No 95-1, 95-2, 95-3, 95-4, 95-5, 95-6, 95-7, 95-8, 95-9
96.	Reflect an opportunity to conduct a census for wild animal and nearby animals and their resettlement on regeneration program	Report 7.6	During the project implementation	Whether census of wild animals and nearby animals is conducted	- Documentation - Photo	Nonconformance	No such research has been conducted	Can be improved
97.	Close unused road and do technical reclamation work	EMP 6-2011	During the project implementation	Whether the reclamation work is performed	- Documentation - QA document	Conformance	The issue has not been raised so far.	
98.	Commence technical reclamation in 2014	EMP 4.6-2013	During the project implementation	Whether reclamation is commenced	- Documentation - QA document - Work plan	Unassessable	The planned period has been postponed, even though it was reflected in the EMP.	Can be improved
99.	Take measures for determining flora type and components by professional entities and studying and protecting rare and extremely rare plant in the future.	EMP 6-2011 3.7-2012 4.4-2013	At initial stage	Whether the measures for determining flora type and components by professional entities and studying and protecting rare and extremely rare plant are taken	- Documentation - Work plan - Report	Conformance	Two professional institutions conducted the researches and training was organized.	See Appendix III. No 99-1, 99-2, 99-3, 99-4
100.	Water a soil to reduce dust storm during dry season, protect topsoil, cover the restored leveled land with topsoil as soon as quick, cultivate, and reclaim it.	EMP 3.5-2012 4.2-2013	During the project implementation	Whether soil is watered to reduce dust blowing, topsoil is protected, restored leveled land is covered with topsoil and surface is	- Report - Documentation - Work plan	Unassessable	Planned reclamation period has been postponed.	Can be improved

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				cultivated and reclaimed during dryness				
Management arrangement and their audit								
101.	Develop annual EMP and EMEP, get approval from the relevant organizations and control their implementation	Report 7.6	During the project implementation	Whether annual EMP and EMEP are developed, approved by relevant organizations and implementation is controlled	- Report	Conformance	Relevant reports are prepared and its implementation control is accomplished.	See Appendix III. No 101-1, 101-2, 101-3, 101-4
102.	Perform an EMP and contribute towards local development with local authority	Report 7.6	During the project implementation	Whether EMP is implemented and contribution towards local development is made	- Documentation	Conformance	Green development work in local area is organized and two wells have been bored and operated under permanent control	
103.	Oversee an implementation of workplace hygiene and occupational safety rules and regulations, involve employees in medical examination at least once a year	Report 7.6	At initial stage	Whether implementation workplace hygiene and occupational safety rules and regulations is overseen	- Occupational safety regulation - Monitoring report	Conformance	Employees are involved in complete medical checkup once a year pursuant to the contract with "Achtan" hospital	
104.	Assign an employee who is in charge of environment at mine	Report 7.6	At initial stage	Whether environment officer works onsite	- Documentation	Conformance	There are 7 environmental officers function under OHSE department.	See Appendix III. No 104-1,
105.	Comply with the EMP and EMEP	Report 7.6	At initial stage	Whether comply with the EMP and EMEP	- Documentation - Report	Conformance	An annual EMP report is developed and approved.	See Appendix III. No 105-1, 105-2, 105-3, 105-4
106.	Submit an annual report for works performed in according to EMP and EMEP to relevant authority in 15, February of every year	Report 7.6	At initial stage	Whether EMP and EMEP implementation report is submitted to the relevant authority in 15, February of every year	- Documentation	Conformance	An annual EMP report is developed and approved.	
107.	Conduct a monitoring study with the assistance of professional organization and develop a management plan based on the study outcome	EMP 6-2011 3.7-2012 4.4-2013	During the project implementation	Whether the monitoring study is conducted with the assistance of professional organization and related management plan based on the study outcomes is developed	- Documentation - Research report - Work plan	Incomplete	Monitoring is conducted but impact-based plan of monitoring and evaluation has not been designed. Evidence:	Can be improved See Appendix III. No 107-1
108.	Strictly comply with relevant Mongolian law and legislations	EMP 6-2011	At initial stage	Whether relevant Mongolian law and legislations are strictly obeyed	- Documentation	Nonconformance	There is no environmental legislation database and monitoring on law provisions has not been conducted.	Can be improved
109.	Suspend earthwork operation and an accurate study will be conducted if archeological and paleontological findings are found	EMP 6-2011	At initial stage	Whether an earthwork operation is suspended and a prudent study is	- Photo - Report	Conformance	Monitoring has done and related report has been prepared.	See Appendix III. No 109-1, 109-2, 109-3, 109-4

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				carried out when archeological and paleontological findings are found				
110.	Ensure to function security guards in workplaces, if it is not possible, build a fence and put caution and sign	EMP 6-2011	Initial stage project	Whether there are security guards in workplaces or fence and caution and sign are put	- Documentation - Report - Material type	Conformance	There are fencing surrounding the mining licensed area and safeguard post.	See Appendix III. No 110-1, 110-2, 110-3

This table shows only the requirements of the EIA report written audit is carried out independently of this legislation. Therefore, in accordance with the provisions of Article 101 of the law on EIA it will not be conducted environmental audits. Some of the EIA report of the Environmental Protection activities and recommendations because it was not appropriate to directly affect the audit. In 2015, according to the law within the mine's environmental audit will be required to correct any non-compliance with the recommendations given by it.

Observation during the audit:

1. The institutions, perform similar activities are located in the same space. In order to determine the integrated environmental cumulative impacts of the companies - ETT, Energy Resources LLC and local TT, where those conduct mining operation in same space, a **cumulative impact assessment** should be undertaken with their joint efforts in accordance with the Article 6 of the law on EIA by professional institution. Impacts of each company or integrated impacts of the companies shall be determined due to this assessment.
2. As Law on Environment was amended in 2012 онд, Regulation on Environmental Audit was approved in 2013 and the mining operation commenced in 2011, so an environmental audit is to be conducted as including main and supporting activities in accordance with the Article 101 of the EPL in 2015. Under this audit, all the aspects of the environmental components like water, soil, air, biodiversity, reclamation, wastes, chemical hazardous substances, environmental management arrangement shall be considered or examined within the national legislations, moreover, in case of revealing noncompliance, related professional recommendations for improvement shall be provided. In order to conduct audit, the professional institutions that have experienced in **environmental audits** for the nationwide big projects, implementing in the country should be chosen.

Extended versions of Environmental audits:

- ~ Water resources management
- ~ Air quality and climate management
- ~ Soil and land management
- ~ Biodiversity management
- ~ Waste management
- ~ Chemical and hazardous substances management
- ~ Reclamation and Mine closure management
- ~ Environmental management arrangement
- ~ Socio-economics, history and physical cultural resources management
- ~ Hygiene and occupational safety management

When a short audit is conducted, it is obliged to include the first six items with the reclamation and land management.

3. Two monitoring boreholes/points have been installed nearby the mine and changes of groundwater level are observed. Besides, the monitoring points sealing is considerably good. Nevertheless, the sealing of the abandoned points were poor. However it is commendable to accomplish control but the quantity of the monitoring point are insufficient. In conformity, the location and quantity of the monitoring points is to be “envelope” shaped. Moreover, water quality study is not conducted in monitoring points.

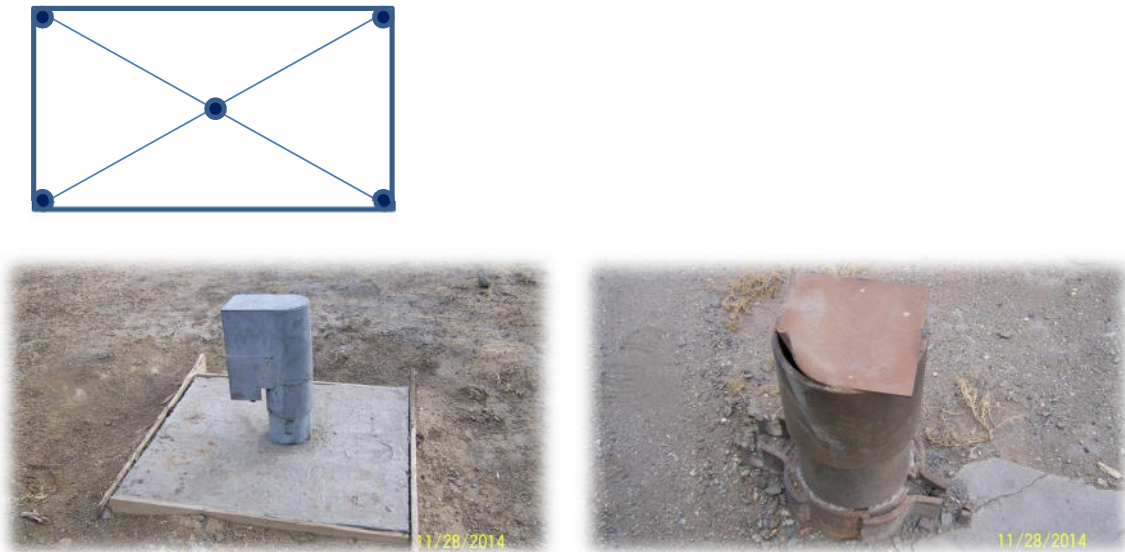


Figure 4.2: Condition of the installed water monitoring points

4. However, it is meritorious to perform environmental monitoring studies and create the related printed database, but the works to entry the studies and research findings into the combined digital database, to analyze and use them in **further environmental policy and planning** were not satisfied. While carrying out environmental monitoring studies, parameters, measurement units, accuracy etc. should be determined in connection with Mongolian standards and future usage of the study's findings should be considered. For instance: Dust emission survey has to be compared with the MNS 4585: 2007 and the survey findings analyzed. In addition, a health risk assessment of the local communities in the impact zone and the employees can be conducted using the survey findings.



Figure 4.3: Environmental monitoring documentation

5. Groundwater quality monitoring is carried out, although softening measures for groundwater with potable standards have not been taken. The groundwater is used for household consumption. However, supplying potable water needs with bottled water seemed as saving the local water resources but the indirect impacts related to long distance transportation of bottled water are higher than this. So this point should be taken into the consideration and it is inevitable to take measures to soften and purify the water into the acceptable level of potable water underlined in the DEAI report 7.6.

6. A study on rainfall water flow has not been conducted and artificial water reservoir has not been built so far. For this type of study, it will be more effective and covering larger areas if professional and domestic resources, and satellite data are used. Furthermore, through such study, the location of the water reservoir must be determined.

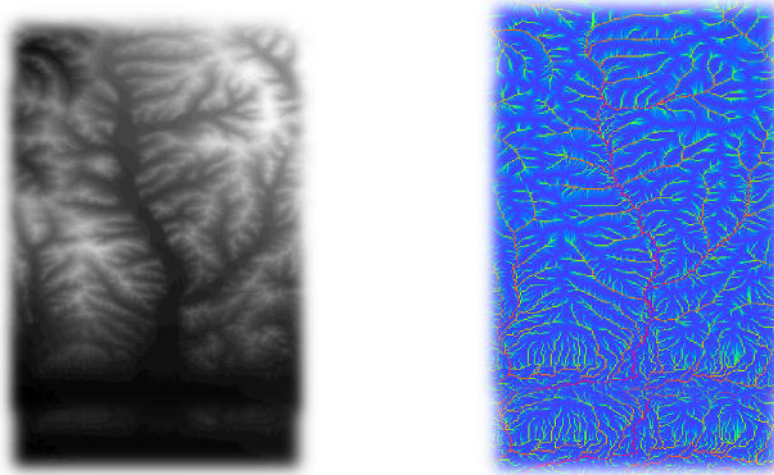


Figure 4.4: Satellite data of water flow

7. The installed and mobile environmental device and equipment in the mine office of the OHSE department responsible for environmental aspects are so insufficient. Shortages of the environmental device and equipment are causing the external organizations involvement in conducting the most study and surveys or direct negative impacts on quality, frequency etc. of the domestic monitoring studies within the company.
8. Movement and resettlement of the newly built facilities, the sparse camping locations of the main and subcontractors show that the mine site layout or arrangement issue is difficult. Therefore, planning a land use and site layout or arrangement, which can ensure the sustainability related to long-term mining operation is essential.
9. A **detailed monitoring plan**, guidance, manuals, standards and procedures on environmental components of EMS such as water, air, soil, plant and animal have not been fully completed in the company. Hence, a detailed action plan on each environmental component should be developed and applied to the internal needs of the company. This action plan shall cover everything from the monitoring point's selection that comprises the all procedures and analysis of the findings until how to reflect them in corporate governance policy.
10. **The justification of designating the locations** of the environmental monitoring points and topsoil stockpiling extremely unclear. For example: The justification of having chosen the current monitoring points locations of Air emission survey and water level study were unclear. Thus, it needs to scientifically determine the justification of choosing location and the current locations may be changed.
11. The **mine impact zone** has not been established yet. The mine impact zones should be identified by each environmental component with an assistance of professional institutions. For instance: an air pollution impact zone can be determined by the dispersion direction, scale, distance or remoteness of the air emitted from the mine and the impacts on animals by their resettlement and movement in that zones or the impacts on flora by scale or magnitude of the plants.

12. There are a OHSE department, seven environmental officers within it. The senior specialist works in Ulaanbaatar office and other six officers work onsite by two shifts. It is appropriate to improve employees' qualification, involve them in professional training on regular basis, do detailed work arrangement/assignment, provide them with the equipment and device and introduce an environmental management complex system and its implementation unit should be separate from the OS department in the **organizational structure**. For example: Every business entity and organization need to implement **environmental internal audit** within the recent introduction of environmental audit in the country. Due to this requirement, the environmental specialist should be involved in environmental auditor special training courses conducted by the professional training centers in 2015. When the environmental activities are stabilized, the unit in charge of environmental policy can be reunited with OS department.
13. There is no **environmental legislation database** and monitoring on related law provisions has not been conducted. Legal compliance audit is conducted within the environmental audit and in order to implement, an experienced professional institution should be selected for it.
14. Human resource plays a key role to maintain a complete implementation **environmental management system** within organization. However, the company pays considerable attention on this circumstance, but consideration of qualification of newly hired employees, orientation to work, and involvement in continuous trainings are not well enough. In particular, a general name of position “environmental specialist” is written on the job description. Subsequently, the goal, objective, tasks, and applicable rule and regulations, scope, and performance indicators must be changed. What is more, the basic requirements of qualifications as ecologist sand biologists are narrowing job opportunities for professional staff. Other natural science qualifications like soil surveyor, hydrologists, climate experts, geographer etc. are not included in the job description.

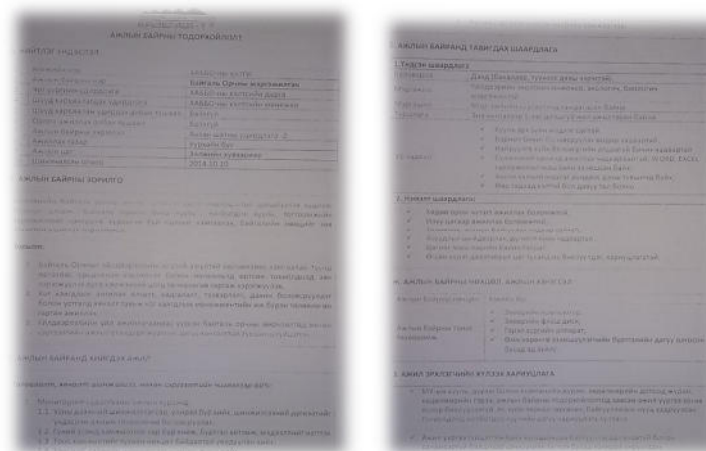


Figure 4.5: Job description of environmental officer of the Environmental department

15. The DEIA report prepared in 2011 was highly considered the mining operation. **DEIA** has not been developed for the activities of auxiliary facilities such as workers' camp, transportation road, electrical transmission lines, maintenance shop and Fuel station.

Consequently, environmental impacts cannot be determined completely throughout the mine. The DEIA must be undertaken in accordance with the law in 2015.

16. The problems on storage, transportation and sterilization of hazardous materials -lubricating materials are extremely uncertain. As of now, they are stored or positioned strictly on ground without any protection. Hence, Store or place hazardous wastes-lubricating materials in the cemented, geo-membrane or rubbery sites surrounding fences, that water-resistant layered and protected from seepage. In a case of hazardous waste spillage, the neutralizing and sterilization substances should be handy.



Figure 4.6: Storage of lubricating materials

17. As coals in the coal storage area are blown up by wind, so the surrounding environments are polluted. It is impressive to install wind protection walls to neutralize wind speed, which is the main cause of pollution.



Figure 4.7: Coal storage of the company

18. Numbers of the environmental device and equipment, currently used by the environmental specialist are not sufficient, there were no **operational manuals** and the **verification** has not been made. Operational manuals of each device must be prepared in native language and operation notebook be recorded. Besides, the devices must be verified by the Standardization and Metrology Agency and Environmental Metrology Laboratory. Otherwise, it is hard to believe the accuracy of the measurement results by uncertified devices.



Figure 4.8: Measurement devices

19. There is no EMP on environmental components; so it was observed that the environmental activities are nonsystematic. This is not the EMP, developed by the Ministry of Environment and Green Development (MEGD), a short, medium, long-term management plan for the each specific environmental component should be designed. Planned tasks, targeted outcomes, required work force, device and equipment, budget, time estimation etc. shall be outlined in this plan. Accordingly, calendar plan and action performance plan should be developed.
20. The function and intended use of the maintenance repair shop is not satisfied. Large heavy techniques are used in the mine, but **the capacity of the shop** is not sufficient to contain these techniques and equipment. As a consequent, it needs to reconstruct the shop or accommodate the capacity with size of the heavy mining techniques and working condition for maintenance worker while relocating. In addition, lifting equipment for handling oversized parts of the mining techniques has to be installed in the maintenance repair shop.



Figure 4.9: Repair shop

21. Required monitoring studies must be conducted not only in outside but also inside. For example: An air quality monitoring is performed outdoor and indoor working places as well.

22. **Load per one coal transportation truck** is exceeded, accordingly the newly built paved road has been damaged and deteriorated finally it was unable for the heavy trucks to travel. Thus, the built road can be fully used as maintaining load amount per one truck pursuant to the applicable norm and accomplishing permanent control over loaded trucks while their travelling on the road. If the road circumstance continues in the similar manner, the environmental and social problems related to transportation dust will be often raised.



Figure 4.10: Coal transportation and road condition

23. Biodiversity, of which **study of fauna** is nearly remained. Therefore, a study on this field needs to conduct.
24. As the heads of other departments have no clear understanding on environmental aspects, the environmental officers are mobilized in indirect tasks by other's assignment. Then the planned tasks are postponed and the seasonal tasks left behind not implementing. Understanding of some managers on environmental protection is limited as the planting trees. In order to improve their knowledge and awareness of environmental aspects, short term or half day training should be organized among the company management.

**CHAPTER V. ENVIRONMENTAL AND SOCIAL MANAGEMENT
IMPROVEMENT**

5.1 Social policy study and recommendations

Tavan tolgoi mine deposit has grown into a haunt and a major trade and business service-providing region from the gobi small soum. Subsequently, positive and negative issues in the soum’s social life have been arosen due the expansion.

The population growth is expanding the market capacity and many public service places such as shops, public catering, hotel, and maintenance and repair center have been established. As a result, of many people have jobs and income. The people have been migrated from the every corner of the country and they earn their living as running their own businesses.

In addition to, coalmine entities have made significant contribution to the soum development and living of the local residents and invested in certain sectors. They signed memorandums with the local administrative organisations and are cooperating within these understanding and scopes.

SWOT analysis in social and economical condition in Tsogttsetsii soum

Table 5.1

Strengths	Weaknesses	Threads	Opportunities
<ul style="list-style-type: none"> • Tavan Tolgoi coking coal deposit with enormous resource; • Market capacity expansion followed by the population immigration; • Most of local residents support the operation of the mining entities • The local governors maintain the operation of the mining entities; 	<ul style="list-style-type: none"> • Shortage of high skilled personnel to work in local minings; • Poor delivery of the government service towards the population • The living of the local residents and the all types of services, industries and commercial businesses depend on coal price fluctuation only; • Shortage of work place for women; • Poor delivery of social services such as school, kindergarten and hospitals; • Lack of correspondence between the mining 	<ul style="list-style-type: none"> • Adverse impacts to the residents health because of the dusts produced by coal mining and transportation; • Risks to environment, graze fields of animal and livestock and their movement by the transportation roads • Negative impacts to traditional cattle-breeding and herders psychology; • Possibility of arising protest or resistance by the native inhabitants /not immigrated/ and the herders; • Possible unemployment increase and work 	<ul style="list-style-type: none"> • The population growth is allowing to expand the business services such as trade, public catering, hotel and maintenance repair centers; • Opportunities to develop family, small and medium size enterprises; • The local population can be provided with work places by their superiority; • Availability to solve some local social issues with the support of the mining entities • Enable to provide with goods, products

	<p>entities /three companies/ on local development and environmental sector;</p> <ul style="list-style-type: none"> • No planning and urban development for Tsogttsetsii soum 	<p>stoppage driven from coal price in the world market</p> <ul style="list-style-type: none"> • Potential risks to increase crime and traffic accidents; 	<p>and services to the mining entities;</p>
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The research team developed the recommendations to improve the social indicators in the following sectors. Herein:

Public relations and advertising:

1. Since the public awareness and attitude towards Erdenes MGL is poor, Public relation /PR/ complete plan is to be developed and implemented.
2. Interrupt to gain information about the company by word of mouth. The main source to get information for the local residents is television. Therefore, it is essential to maintain permanent broadcasting of target TV program and news, current events via news programs. For example, there are no environmental information and news on the company website as of 28th of November 2014. Also being no social pages such as Face book, twitter and unclear whether they cooperate with the local social media indicates there is noncompliance in this field. Subsequently, information toward to public community should be enhanced through the company official website, social pages, periodic publications, and toll television throughout the local area and the country and the actual cooperation.
3. Investing in many small projects within the memorandums to cooperate with the local state administrative orgasitions and corporate social responsibility is not permanently informed to the citizen and their outcomes are not visible. That is why, investment in the tangible things /operation, construction and infrastructure/ which are visible with citizens’ eyes requires;

Improvement of environment protection and coal transportation:

4. Present and make public the environmental impact assessment reports of coal mining to the citizen, information on mining rehabilitation and the environmental protection plan to mitigate and eliminate adverse impacts derived from mining operation;
5. The residents of Tsogttsetsii outlined the most urgent issue was “dust”. Therefore, an utmost consideration is required to eliminate dusts produced by the mining and its operation, introduce new dust suppression technologies and present them to the citizens;
6. Build a paved road from the soum center to the mining camp. Road construction has great importance to eliminate the dusts.
7. Pay an immense attention to the coal transportation and maintain the coal truck travelling on paved road. Cooperate with Energy Resources and local Tavan Tolgoi to

introduce railway in the future and actively participate in facilitate the railway project with Government and related organisations;

Measures to be taken for herder families:

8. Pay an extreme attention on herders' families settled in the area upto 10 kms nearby the mining field and along the coal transportation road. Regarding to this matter, develop a plan and initiate proposal with Energy Resources and local Tavan Tolgoi;
9. Study possibility to and obey a regulation on compensating the herders by particular percentage of expenses for their resettlement of winter and spring cattle sheds as of mining adverse impacts, eventhough the area is not included in the impacted area due to related legislation;
10. Give the herders prudent understanding of mining operation and change their attitude;

Maintain education and health:

11. The scholarships should be granted to the certain numbers of students on the basis of a policy, program and criteria that specially developed, public announcement and competition and enrollment by the company not upon the local governors' request when paying tuition fees of local students;

The practice of Energy resources showed that setting the criteria of grade point average extremely high makes the residents objection in reverse. Thus, strong consideration should be taken to establish the criteria;

12. Consider whether the company can assist to construct an extension for secondary school, kindergarten of the soum and enlarge their capacity and solve it;
13. Support to soum human resources capacity buildings particularly, teachers and physicians and involve them in trains;
14. Paying particular attention to maintain the health organization will receives the citizens' gratitude as observed from the survey participants speech.

Providing the local residents with work places and maintain the social vulnerable population of the soum:

15. Both the local residents and the representatives of the company agreed that the ETT had one-step back on providing the local resident with work place. Subsequently, adopt a policy to employ more local residents through mentoring and involvement in trainings, in vocational training centers and internship.
16. Entitle the local camp administrator, human resource associates to recruit /reconsider and improve the system to make a decision on new recruitment only in the head offices/ the candidates from the local community;
17. Explore and implement the ways to employ the locals through setting a criteria for the public catering service provider entities to train and hire them;
18. The local governors and residents said there were considerable numbers of families with elder, disabled and valetudinarian members and at the level under living standard among the soum native inhabitants. Hence focus on contribution in living of the social vulnerable families and citizen;

Employees' social problems:

19. Accelerate a plan to construct apartment blocks for the employees avoiding the future possible social adverse impacts derived from keeping the employees in camps away from their families;
20. Solve the work place issues for the immigrant workers' families and their wives whose husbands work in the coalmine with the local state administration and other two mining entities completely.
21. Cooperate with the local administration, citizen and entities to develop the small and medium size enterprises followed by mining. Provide locals an opportunitie to them the procurement superiority based on certain criteria. For instance, as maintaining the sewing factory for work and personal protective clothes, both the soum work places and vacancies for the miners families and wives will be able to increase;

Close cooperation with the state administration organizations:

22. Regularly renew and obey the "memorandum of cooperation" with local governors on annual basis;
23. Support and cooperate with the local government service providing organizations as possible as can. Especially, encourage the traffic police division's activities and enhance the control over the transporters and drivers together and so forth;

5.2.Environmental Impact Assessment control and recommendation on reducing adverse impacts

While examining environmental impacts of open pit of East Tsankhi, positive and negative aspects, soil, biodiversity, air, water, as well as main and potential impacts have been covered. It was based on the DEIA report, designed by "IkhAilchin" LLC in 2011, in addition the impacts not specified in this report, their preventive and mitigating measures were included as marked +.

The impacts are classified as the following 3 phases.

1. Mine phase
2. Mine closure phase
3. Mine post closure phase

Environmental potential impacts for those phases have been determined, and their preventive and mitigating measures have been outlined as well.

The environmental impacts and preventive and mitigating measures have been specified in the previous DEIA report as below.

Impacts reflected in the DEIA report

Table 5.2

No	Environment	Impact	Preventive measure	Mitigating measure	
Mine phase					
1	Soil	Potential	5	0	3
		Main	5	2	6
2	Biology	Potential	1	0	0
		Main	0	0	0
3	Water	Potential	0	0	0
		Main	0	0	0
4	Air	Potential	5	5	3
		Main	2	5	3
Mine closure phase					
1	Soil	Potential	1	0	0
		Main	2	1	3
2	Biology	Potential	2	0	0
		Main	0	0	0
3	Water	Potential	1	0	0
		Main	2	0	0
4	Air	Potential	1	0	0
		Main	3	2	3
Mine post closure phase					
1	Soil	Potential	1	0	0
		Main	0	0	0
2	Biology	Potential	0	0	0
		Main	0	0	0
3	Water	Potential	0	0	0
		Main	0	0	0
4	Air	Potential	0	0	0
		Main	0	0	0

If concluded as above, the impacts of the mine phase have been dominated, but impacts of the mine closure and post mine closure phase reflected less in the report. In our observation, the report focused on soil and air quality more, but less considered the biodiversity and water.

The following environmental impacts, their preventive and mitigating measures are additionally involved upon the action planning, illustrated in above table.

Impacts, determined in addition

Table 5.3

No	Environment	Impact	Preventive measure	Mitigating measure	
Mine phase					
1	Soil	Potential	1	5	1
		Main	7	4	0
2	Biology	Potential	1	2	3
		Main	3	3	2
3	Water	Potential	3	1	1

		Main	2	1	1
4	Air	Potential	0	1	1
		Main	2	0	0
Mine closure phase					
1	Soil	Potential	2	1	2
		Main	4	3	2
2	Biology	Potential	1	2	2
		Main	1	1	1
3	Water	Potential	0	1	1
		Main	4	2	2
4	Air	Potential	0	1	1
		Main	0	0	0
Mine post closure phase					
1	Soil	Potential	2	1	1
		Main	3	1	1
2	Biology	Potential	2	1	1
		Main	2	2	1
3	Water	Potential	2	1	0
		Main	0	0	0
4	Air	Potential	2	1	1
		Main	2	1	1

If illustrating in a combined way of previously conducted assessment and additional action plan:

Combined impacts

Table 5.4

No	Environment	Impact	Preventive measure	Mitigating measure
Mine phase				
1	Soil	18	11	10
2	Biology	5	5	5
3	Water	5	2	2
4	Air	9	11	7
Mine closure phase				
1	Soil	9	5	7
2	Biology	4	3	3
3	Water	7	3	3
4	Air	4	3	4
Mine post closure phase				
1	Soil	6	2	2
2	Biology	4	3	2
3	Water	2	1	0
4	Air	4	2	2

Environmental impacts during the mine phase and their preventive and mitigating measures

Table 5.5

Soil		Impact	Preventive measure	Mitigating measure
Potential impact	Adverse	<ul style="list-style-type: none"> - Soil erosion - Geology deformation - Mechanic erosion during soil stripping, quality changes in soil chemical and physical characteristics, geomorphic parameters during construction may cause soil erosion and natural beauty can be varied - Soil can be contaminated because of oil leakage from Vehicles, automotive and household and liquid wastes thrown away by the employees - Air pollution may cause soil contamination 	<ul style="list-style-type: none"> + Prevent the construction area from rainfall and flood and build dams in all sides where the water can come into + In order to prevent soil contamination from lubricating materials, ensure the integrity of transportation vehicles parking area, routes. The road maintenance and reconstruction work should be performed. + Solid and liquid wastes, petroleum products should not be disposed at the construction site and nearby areas. + Take soil samples and make testing by professional institution + Eliminate air pollution + Maintain and improve the condition of the coal transportation road 	<ul style="list-style-type: none"> - Perform restoration work in the impacted areas during the construction work. - Study on land surface erosion and degradation characteristics and certification for soil characteristics and quality shall be carried out once per year. - Classify and use topsoil stripped from the construction areas + Take preventive measures against soil contamination from household wastes and petroleum products. Ensure its implementation and maintain control
	Positive	<ul style="list-style-type: none"> + All findings collected during the monitoring studies are useful for research work on Gobi soil and they are contributing to have more understanding on the soil characteristics in the harsh condition. 		

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Main impact	Adverse	<ul style="list-style-type: none"> - Loss of valuable and fertile soil - Natural deformation - Deformation not only in land shape, view, but also in the structure - Wind, water, ice and gravity forces can cause soil and rock degradation - Contaminate from hazardous substances and wastes + Occur erosion and sedimentation + Collapse of natural habitats for some animals + Lack of surface plants cover/ cuticles + Slope instability + Shortage of land surface resources + Shortage of minerals and their stores 	<ul style="list-style-type: none"> - Maintain protection and install fencing surrounding operation areas and the mine site - Store the fertile soil of the mine site areas in outdoor stockpiling; furthermore reuse it for biological rehabilitation, pasture and plantation. Prevent from soil weathering + Create boundaries in the areas where the plant degradation occurs or non-occur. + Do not allow the access of non-related machine techniques in the areas, where the plant cover is not degraded + Installing fences in the area is important to protect the natural plants and restored plants. + Prevent soil erosion from creating many branch roads and put signs. 	<ul style="list-style-type: none"> - Restoration works of soil erosion and degradation nearby mine site has to be reflected in annual environmental reclamation plan and implemented in accordance with applicable standards. - Maintain an implementation of measures to prevent soil contamination from household wastes and petroleum products and put control over it. - Fertile soil from soil stripping areas should be piled separately and used them in rehabilitation. - Create soil stockpiling properly due to the Mine plan - Requirements for soil storage in long term should be specified in the Mine plan - Coal transportation roads routes shall be approved on the basis of agreement with related local governors
	Positive	<ul style="list-style-type: none"> + All findings collected during the monitoring studies are useful for research work on Gobi soil and they are contributing to have more understanding on the soil characteristics in the harsh condition. 		
Biodiversity		Impact	Preventive measure	Mitigating measure
Potential impact	Adverse	<ul style="list-style-type: none"> - Animals and birds can flee + Plants species may degrade and grind, then become extinct within this area. 	<ul style="list-style-type: none"> + Prior to mine, biodiversity detailed investigation is to be carried out and potential risks to be assessed, on this 	<ul style="list-style-type: none"> + The issues of ensuring springs restoration shall be included in the biodiversity protection plan in order to maintain the sustainable growth of the animals

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			<p>basis preventive actions to be planned.</p> <ul style="list-style-type: none"> + Prevent the animals from fleeing the natural habitat 	<ul style="list-style-type: none"> + Implement comprehensive measures, planning and arrangements to minimize the biodiversity impacts with the presence of Non-Government Organizations + Enhance possibilities of local environmental protection officers to work proactively/communication, transportation, economical intensives/
	Positive			
Main Impact	Adverse	<ul style="list-style-type: none"> + Natural animals may flee and plants and soil pests, insects may become extinct because of the population density, road, mine and blasting noise + May cause a change of locations of the open water points, then it can lead to resettle the animals to another watering points as a result of project + During soil stripping, insects and creeping animals may become extinct or flee 	<ul style="list-style-type: none"> + To commence operation after taking preventive measures to adapt the wildlife in proper balance + Take measures to study and protect soil and plants components and take into account the issues of not firing saxaul, replant the natural trees and shrubs for restoration. + Take measures for avoiding loss of location of watering points and areas 	<ul style="list-style-type: none"> + Enhance possibilities of local environmental protection officers to work proactively /communication, transportation, economical intensives/ + The issues of ensuring springs restoration shall be included in the biodiversity protection plan in order to maintain the sustainable growth of the animals
	Positive			
Water		Impact	Preventive measure	Mitigating measure
Potential impact	Adverse	<ul style="list-style-type: none"> + Mine rock drainage or toxic outflow may flow in the surrounding areas. + Ecosystem along the flow and/or below the mine areas may affect and it can result in a lack of water supply to the local community. + Possible reactions in water rock can contaminate surface and groundwater resources. 	<ul style="list-style-type: none"> + It is essential to reflect the issues in the manner of not causing less harm to water environment, groundwater, nearby surface water system as possible in EPP and prevent from adverse impacts 	<ul style="list-style-type: none"> + Conduct a water monitoring study on regular basis, in a case of contamination and degradation, related restoration and mitigating measures should be taken
	Positive			

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Main impact	Adverse	<ul style="list-style-type: none"> + Transportation and storage of various hazardous chemicals such as fuel, oil, lubricants, cleansing chemicals, explosives, solvents and paints in operation and production activities of the mine + The mine site may fill with flood, furthermore it can cause obstacles in mining operations and contaminate the surroundings 	<ul style="list-style-type: none"> + It needs to install flood protection dams and trenches surrounding the mine site, in addition to avoid using any hazardous chemicals and to obey applicable instruction and procedure if uses. 	<ul style="list-style-type: none"> + Minimize adverse impacts by the means of performing actions for example reusing the groundwater and seepage water for watering mine areas during mine phase.
	Positive			
Air		Impact	Preventive measure	Mitigating measure
Potential impact	Adverse	<ul style="list-style-type: none"> - Dust emission during soil stripping - Huge dust and great noise are generated from drilling, blasting and the holes, pits and dumps created by mining can cause a constant source of dust in windy conditions. Air is polluted - Air can be sizably polluted while loading the stripped soil by excavator into auto dump trucks - Mining operations have a significant impacts on air quality in the ways of burning of fossil fuels, excavation and drilling and construction of the camping - Dusts and smoke emitted from the internal combustion engine can affect air quality of the nearby mine. 	<ul style="list-style-type: none"> - Improve the conditions of constant use roads and car parking areas of mine camping and mine and pave them - Water the coal transportation roads depending on weather - Accumulate the mine seepage water and investigate the opportunity to use it for watering roads against air dust. Take related implementing measures - Blasting should be conducted in connection with weather condition - Use efficient stove and smokeless fuel for heating the staff temporary facilities + Remove household wastes shortly and make disinfection in disposal or waste points in regular basis, prevent from poor odor, which causes the air pollution. 	<ul style="list-style-type: none"> - The level of dust and other air pollution parameters shall be measured at the chosen points at regular intervals. In a case of the measures results exceed than the allowed contained volume, implement prompt measures to minimize - Measures to eliminate and minimize potential impacts on air quality during the construction and further activities of the project shall be reflected in EPP and environmental monitoring and evaluation program of the project - Air samples should be examined, air pollution be determined in planned period. Take related measures accordingly. + Take measures to filter and clean poisonous smoke emitted from mining machine and mechanism chimney until permissible level

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	Positive			
Main impact	Adverse	<ul style="list-style-type: none"> - Dust generated from travelling vehicles is released along the transportation road and below areas of the wind - Dust and poisonous fumes generated from combustion engine function of heavy truck, mechanism and equipment + Coal coarse culm generated from the mining is hugely released in the air + Coal fine dust will spread throughout the mine areas by wind 	<ul style="list-style-type: none"> - To water soil and transportation road depends on weather - Accumulate the mine seepage water and investigate the opportunity to use it for watering roads against air dust. Take related implementing measures - Blasting should be conducted in connection with weather condition - Use efficient stove and smokeless fuel for heating the staff temporary facilities - Protect lubricants from evaporation 	<ul style="list-style-type: none"> - To observe the dusts in the mine site and get samples from the work place and conduct related monitoring study - Create a proper stockpiling model in order to minimize dust emitted from soil stockpiling because of strong wind. - To compact dry loose soil and cover with gravel or plant
	Positive			

Environmental impacts during the mine closure phase and their preventive and mitigating measures

Table 5.6

Soil		Impact	Preventive measure	Mitigating measure
Potential impact	Adverse	<ul style="list-style-type: none"> - Soil can be contaminated because of oil leakage from vehicles, automotive and household and liquid wastes thrown away by the employees + Air pollution may cause soil contamination 	<ul style="list-style-type: none"> + Remove household wastes shortly and make disinfection in disposal or waste points in regular basis 	<ul style="list-style-type: none"> + Develop and implement a waste management + Minimize an air pollution
	Positive	<ul style="list-style-type: none"> + Provide an opportunity for soil and plant to be restored 		
Main impact	Adverse	<ul style="list-style-type: none"> - Loss of surface plant cover - Contaminate with hazardous waste and wastes + Cause an erosion and sedimentation + Collapse of natural habitats for some animals 	<ul style="list-style-type: none"> - Restoration of plant cover, and plantation works should be performed in the areas where construction and facilities were built + Use the native plants, shrubs of the area and select the viable native plants can be restored and prepare the seeds preservation + Take various measures to prevent plants outside the construction area and roads from degradation and install fence where requires and do not allow vehicles to travel through place where the plant covers are not degraded plant used to rehabilitate the topsoil stock pile is stored in abufferare a topography 	<ul style="list-style-type: none"> - Fertile topsoil and less fertile soil should be covered and levelled in the levelled, slope and formed areas. - To compact dry loose soil and cover with gravel or plant - Develop and implement a mine closure plan + A land formation design should be designed and implemented in the technical and biological rehabilitation of outdoor stockpiling

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			+ The fertile soil stockpiling for plant restoration should keep the land surface formation of the surrounding area	+ Create a proper stockpiling model in order to minimize dust emitted from soil stockpiling because of strong wind.
	Positive	+ Provide possibility to have the first form of the degraded soil and plan covers + Stockpiles and quarries are being reduced, eliminated and restored.		
Biodiversity		Impact	Preventive measure	Mitigating measure
Potential impacts	Adverse	- Animals and birds can flee - Pastures can be degraded + Plant species may degrade and grind, then become extinct within this area.	+ Implement comprehensive measures, planning and arrangements to minimize the biodiversity impacts with the presence of Non-Government Organizations + To open up a circumstance for the fled animals from the impacted zone to return back the natural habitat after mine closure	+ Organize activities such as resettlement of animals, open a gateway, attract the animals fled to the another place with the other companies + Implement comprehensive measures, planning and arrangements to minimize the biodiversity impacts with the presence of Non-Government Organizations
	Positive			
Main Impact	Çöper	+ Natural animals may flee and plants and soil pests, insects may become extinct because of the population density, road, mine and blasting strong noise	+ Implement comprehensive measures, planning and arrangements to minimize the biodiversity impacts with the presence of Non-Government Organizations	+ Implement measures to adapt biodiversity in the area and maintain an adjust protection
	Positive			
Water		Impact	Preventive measure	Mitigating measure

Review of the Tavan Tolgoi Environmental and Social Management System

Potential impact	Adverse	- Various hazardous chemicals such as fuel, oil, lubricants, cleansing chemicals, explosives, solvents and paints may affect water pollution	+ It is utmost important to manage to the issues related to solve and dispose the chemical hazardous waste outside environment not causing harm to the population and environment for the mine companies. The Government and community control over wastes also plays a key role.	+ Main criteria to mitigate impacts on groundwater is the well-developed design and arrangements of the structures such water pipelines of the buildings, in addition, effective and economical operation, and the monitoring measures.
	Positive			
Main impact	Adverse	- Immense contamination of soil and rock environment may cause negative impacts on water + Level of groundwater may be lowered + Lowering of groundwater level leads to dry up the nearby surface water – springs and well	+ It is utmost important to manage to the issues related to solve and dispose the chemical hazardous waste outside environment not causing harm to the population and environment for the mine companies. The Government and community control over wastes also plays a key role.	+ If there are any direct and indirect impacts on surface and groundwater quality because of project activities, an erosion and sedimentation control management, monitoring and evaluation and implementation control, remediation plan and programs shall be implemented.
Air		Impact	Preventive measure	Mitigating measure
Potential Impact	Adverse	- Wastes and lubricants may cause air pollution	+ Transport and store wastes and lubricants in proper way	+ It requires to plan and organize a mine closure in detailed and to leave the mined area without liquid, solid wastes
	Positive			
Main impact	Adverse	- Sizable dust generation from transportation of piled soil - Dust emission from compaction and levelling work	- Conduct activities related to weather condition - Dump the mine site	- Detailed mine closure plan and well organization is required - Coordinate mine closure with weather - Remove and transport the generated wastes properly

		- Poisonous fumes and smoke emitted from transportation vehicle and techniques		
	Positive			

Environmental impacts during the mine post closure phase and their preventive and mitigating measures

Table 5.7

Soil		Impact	Preventive measure	Mitigating measure
Potential impact	Adverse	- Soil can be contaminated because of oil leakage from vehicles and automotive	+ Maintain a constant environmental protection and prevention activities during mining and mine closure phases	+ Implement the EMP and Environmental Monitoring and Evaluation Program (EMEP) in accordance with the applicable laws and regulations
	Positive	+ Provide possibility to have the first form of the degraded soil and plan covers + Stockpiles and quarries are being reduced, eliminated and restored.		
Main impact	Adverse	+ Degraded soil, various chemicals, lubricants, household and other wastes saturated in soil during mining will have certain impacts on environment after the mine closure	+ Maintain a constant environmental protection and prevention activities during mining and mine closure phases	+ Implement the EMP and EMEP in accordance with the applicable laws and regulations
	Positive	+ Amount of dust will be reduced as travelling of mining machines and techniques is stopped + No more noises		
Biodiversity		Impact	Preventive measure	Mitigating measure

Review of the Tavan Tolgoi Environmental and Social Management System

Potential Impact	Adverse	+ The animals and birds fled because of mining and noise may not come back	+ Create a suitable situation for fled animals to return back to natural habitat after mine closure	+ Organize activities such as resettlement of animals, open a gateway, attract the animals fled to the another place with the other companies
	Positive	+ The fled animals may come back and relocate there as the pasture and plants have being restored since the mine closure		
Main impact	Adverse	+ It is impossible to restore the natural first form by 100% after mining and its closure. Moreover, natural harmony of interdependence of components of plants, animal, water and soil will be lost, and then environment deterioration can be getting worse.	+ Investigate the basic circumstances of the environment and implement the restoration work which enables to make closer its first form in accordance with the applicable procedure after the mining + Take measures to prevent nearby animals from fleeing and becoming extinct as possible.	+ Conduct a biodiversity study and monitoring, develop a biodiversity protection plan and implement them with other environmental protection organizations
	Positive	+ In a case of conducting the mine closure and rehabilitation works well, the plants and pasture restoration will improve. It makes the condition more decent and livable for animals		
Water		Impact	Preventive measure	Mitigating measure
Potential impact	Adverse	+ Water environment polluted in mining period may affect water quality	+ It needs to implement an erosion and sedimentation management control in the project area and EMEP, intermediary program to control the implementing measures	

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	Positive	+ There will be no more risk to cause water pollution because of mining various activities after mine closure		
Main impact	Adverse			
	Positive			
Air		Impact	Preventive measure	Mitigating measure
Potential impact	Adverse	+ If plants are not restored well after rehabilitation, dust will release in a strong wind that may cause air pollution	+ Perform a restoration and plantation work in accordance with the standards and procedure	+ Perform a restoration and plantation work in accordance with the standards and procedure
	Positive	+ Air pollution will be less than the mine period. Air will be refreshed.		
Main impact	Adverse	+ After mine closure nearby soil will be loosen, accordingly enormous dust will release in the area	+ Keep a humidity by constant watering after plantation	+ Perform a restoration and plantation work in accordance with the standards and procedure
	Positive	+ Air pollution will be less than the mine period. Air will be refreshed.		

5.3. Environmental management system and structure

Current situation:

For ETT, the unit in charge of environmental aspects has following structure.

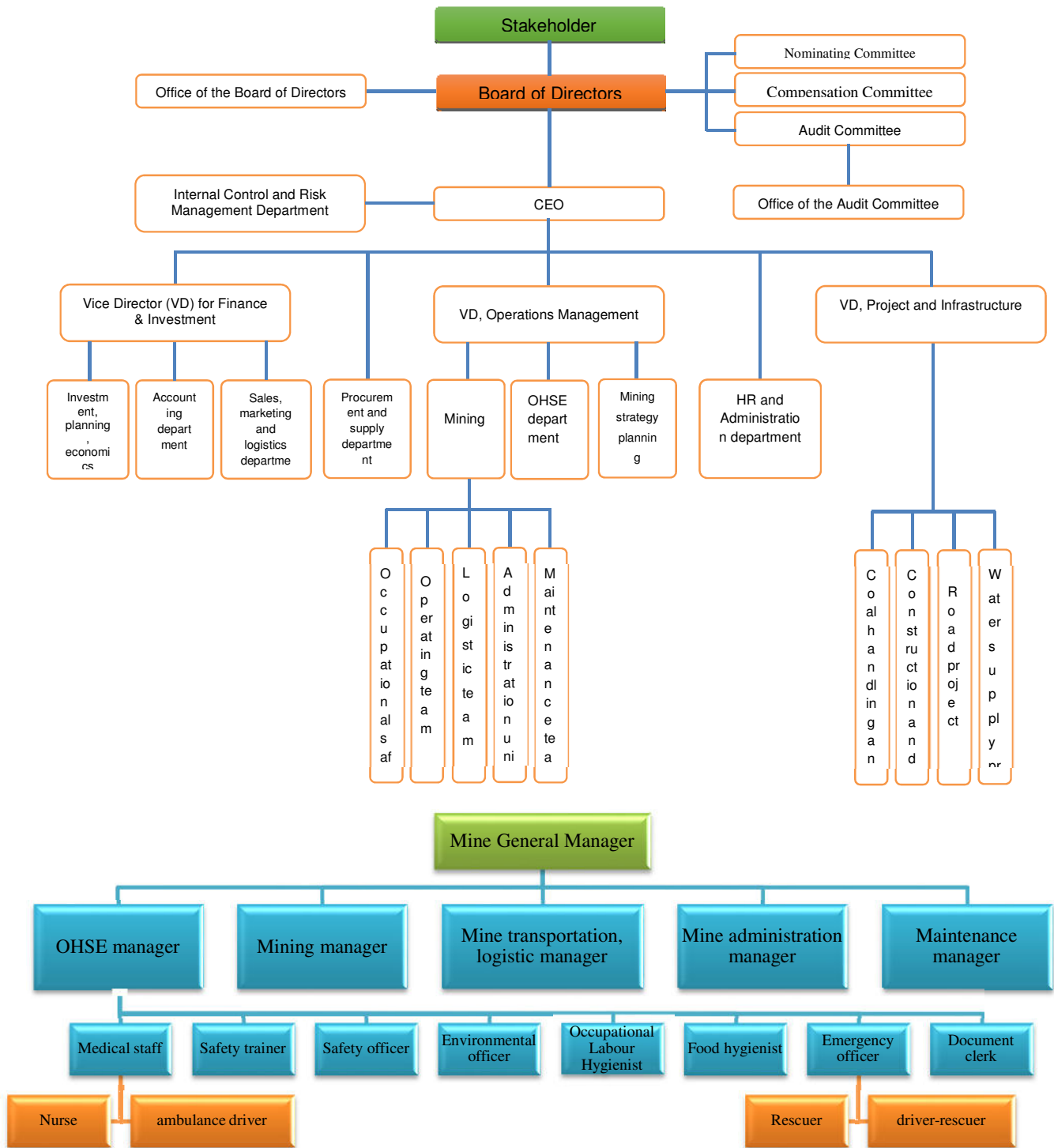


Figure 5.1: Current structure the department in charge of environmental aspects

In other words, HS and Environment one Department will function under the Vice Director for Operations Management within the corporate governance. Initially it was assumed to have one position for environmental officer at the mine site. Later in relation with the union of some departments of the East and West Tsankhi, the department is reorganized as a combined ways in Occupational Safety, Environment, and Hygiene. There are 7 specialists in charge of environmental aspects, of which 1 senior specialist works in Ulaanbaatar office, rest six are working onsite by two shifts.

Information of the environmental officers of the Occupational Safety department.

No	Surname	First name	Sex	Position	Qualification	Education	Phone number
1	Batbaatar	Orgil	Male	Environmental officer	Land Tenure	Post graduate Master degree	99064609
2	Tsendjargal	Burenjargal	Female	Environmental officer	Environment Monitoring and Evaluation	Under graduate Bachelor degree	88008478 91117710
3	Oyunbat	Unenhuu	Male	Environmental officer	Natural science teacher	Under graduate Bachelor degree	89030098
4	Baatar	Bolor	Female	Environmental officer	Production ecology	Post graduate Master degree	88118615 99933316
5	Munhdelger	Gerelt-od	Male	Environmental officer	Industry ecology engineer	Under graduate Bachelor degree	89192087
6	Altsuh	Azzaya	Female	Environmental officer	Environmental engineer	Under graduate Bachelor degree	99281160

Human Resource Associate S.Odontsatsralt

/signed/

Their involvement in the trainings:

- ~ B.Orgil Research field: Mining reclamation/rehabilitation.
Master degree in Khukh city, Republic of China
- ~ B.Bolor Research field: Mining ecological assessment and reclamation
Master degree, Mongolian University of Science and Technology
- ~ A.Azzaya Research field: Reuse of gray water, Bachelor degree in Shanghai

As outlined in above figures, the retrain or specialization process of the environmental staff and unit within this corporate governance and mining organizational structures is not qualified in current situation although the numbers of the specialists are satisfied. In consequently, the following management system, its implementing structure components and relevant addressed issues are recommended as below.

Environmental management system

The internationally obeyed classic model of environmental management system is recommended to use in ETT East Thankhi coalmine in order to improve its environmental management system.

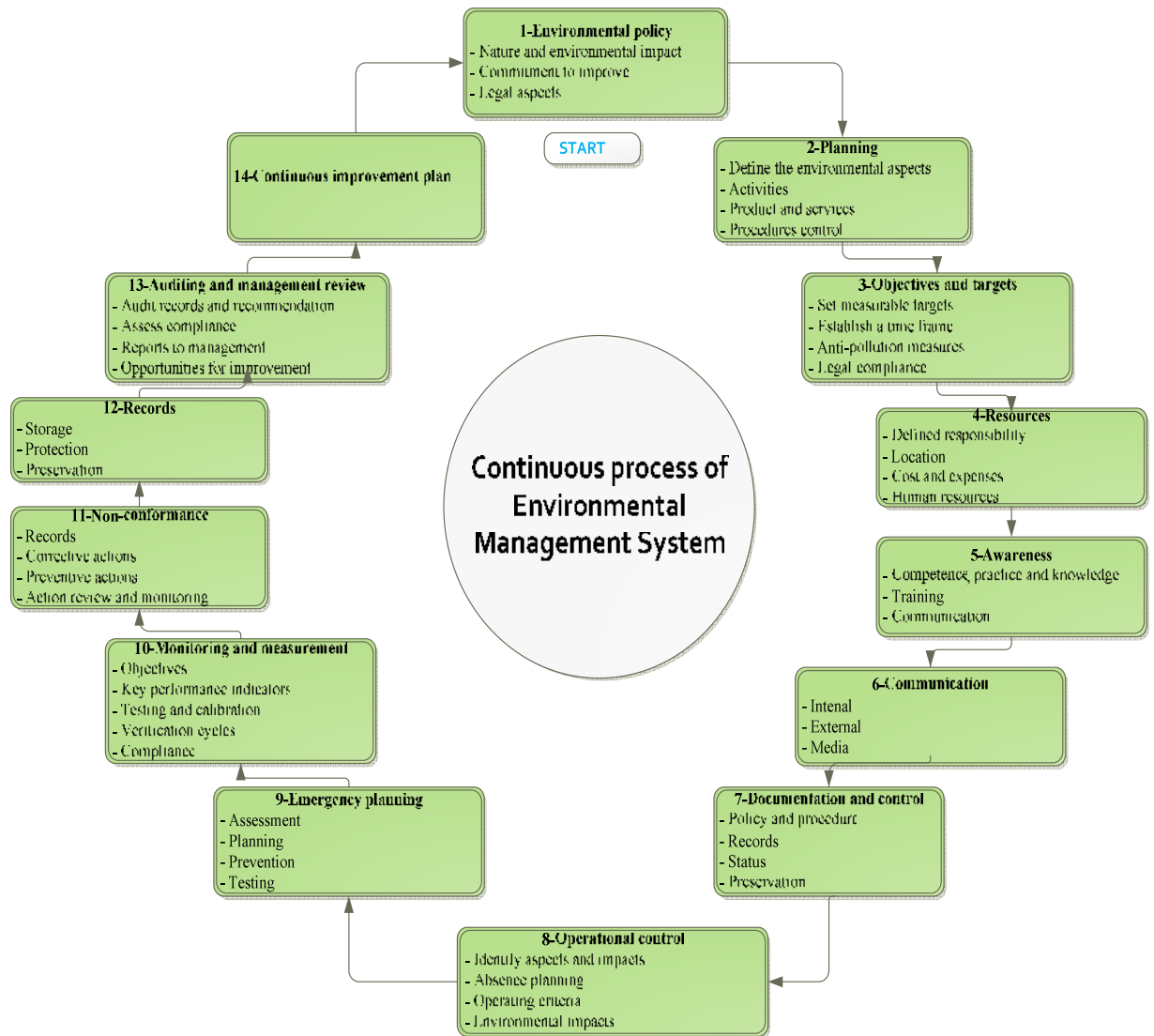


Figure 5.2 Environmental management system model

The above environmental management system model is the cycle shaped and nonstop continuity process and it consists of 14 stages. Herein:

1. Environmental policy
 - ~ Nature and environmental impact
 - ~ Commitment to improve
 - ~ Legal aspects

The processes to establish the environmental policy along with defining possible environmental impacts derived from mining operation, controlling any activities with adverse impacts and formulating and complying with an internal rule and regulation to mitigate and studying the international and national law and legislation acts are consisted of within this stage.

2. Planning

- ~ Define the environmental aspects
- ~ Activities
- ~ Product and services
- ~ Procedures control

It requires defining environmental key indicators of the project location accurately and conducting basic study, consequently, planning activities, production and services and establishing procedures control at this stage.

3. Objectives and targets

- ~ Set measurable targets
- ~ Establish a time frame
- ~ Anti-pollution measures
- ~ Legal compliance

As far as applying the objectives and targets can be measured as a quantity and quality manners within the environmental management system, and a time frame is to be established, anti-pollution measures are planned and legal compliance should be maintained.

4. Resources

- ~ Defined responsibility
- ~ Location
- ~ Cost and expenses
- ~ Human resources

At this stage, the human and financial resources and planning aspects need to be considered and solved some issues such as assigning specialists in charge of specific environment aspects and allocation of them concerned work responsibility and sorting out the dynamic and static expenses issues required for meeting job description and obligations.

5. Awareness

- ~ Competence, practice and knowledge
- ~ Training
- ~ Communication

It is vital to involve the employees in regular trainings in order to promote the competence of organization environmental officers and imply the environmental policy. Moreover, procedures of getting permits from the environmental department and informing them must be

clear in connection with appropriate management of communication methods and activities between the environmental officers.

6. Communication

- ~ Intenal
- ~ External
- ~ Media

Developing policy and plan on both internal and external communication and public relations via media is essential.

7. Documentation and control

- ~ Policy and procedure
- ~ Records
- ~ Status
- ~ Preservation

All above processes including procedures, policy and plan need to be verified in writing and regularly recorded the arisen circumstances and stored properly.

8. Operational control

- ~ Identify aspects and impacts
- ~ Absence planning
- ~ Operating criteria
- ~ Environmental impacts

After the project commencement, environmental aspects and impacts to affect need to be reviewed through permanent monitoring. In addition, if there are any planning error and missing items, the corrective plan against those absences must be formulated. Thus, the criteria for assessing an environmental protection and anti-pollution actions need to be set out.

9. Emergency planning

- ~ Assessment
- ~ Planning
- ~ Prevention
- ~ Testing

Developing an emergency planning is required except the planning for the normal operating condition after the project commencement. It consists of from the definition of emergency, setting of protective measures, and procedure of testing before and after emergencies and so on.

10. Monitoring and measurement

- ~ Objectives
- ~ Key performance indicators

- ~ Testing and calibration
- ~ Verification cycles
- ~ Compliance

The short and long-term monitoring programs and their key performance indicators or key elements are designed in order to control the adverse impacts and positive effects, scale and line of activity. The monitoring program contains not only measurement and testing methods, operational procedures but also required tools and equipment, review on study findings, testing and approval.

11. Nonconformance

- ~ Records
- ~ Corrective actions
- ~ Preventive actions
- ~ Action review and monitoring

During the nonconformance or organization's internal auditing, the all activities performed at previous ten stages are reviewed, any revealed conformance and nonconformance are recorded, and their corrective actions are solved with the presence of the concerned people. Except the nonconformance auditing, the preventive actions and their performance audit is conducted.

12. Records

- ~ Storage
- ~ Protection
- ~ Preservation

The related materials on the all actions, decisions at each previous stage must be stored in printed or digital electronic manner and they can be used in the future as an adjustment.

13. Auditing and management review

- ~ Audit records and recommendation
- ~ Assess compliance
- ~ Reports to management
- ~ Opportunities for improvement

This is the most important stage and the all the measures taken on environmental aspects are reviewed by external professional auditing organizations and related recommendations are given. The environmental auditing system legislated in the law of Mongolia on Environmental protection and it is compulsory to conduct in every two years. During auditing, the project is assessed by the applicable indicators specified in accordance with the national laws and legislations. Moreover, if there is some nonconformance, the recommendation to correct is put forward.

14. Continuous improvement plan

Plan to correct the nonconformance, revealed at the preceding stages shall be developed based on the auditing report and conclusion. Corrective actions are taken from the first stage due to the improvement cycle.

The policy, plan and activity in ETT East Thankhi coalmine will be considerably improved as implementing the above model of environmental management system.

Recommendations on environmental management team

We are recommending the structures and members of the environmental management team who is responsible in functioning of the environmental management for ETT East Tsankhi coalmine. The department or team plays a role of developing the organization environmental policy and objectives, implementing and monitoring them.

Functioning status within the organization is under the direct management of CEO, which ensures effective operation. A cross-functional level with other departments is recommended. In addition to, it should be organized separately from the Occupational health safety and environmental hygiene (OHS&EH) division is advisable and further can be joined with OHS&EH division when the environmental system operates in proper ways.

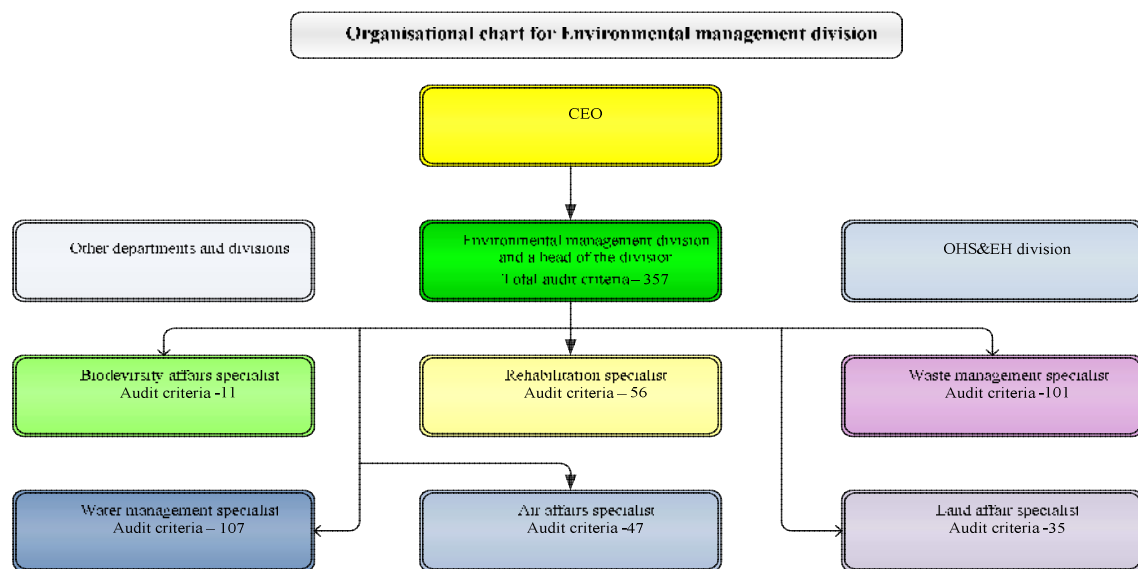


Figure 5.3 First option for Environmental management division

When the above option was created, environmental components, relevant national legislation, policy, plan and audit directions are considered accordingly and this is the strongly recommended one. In accordance with this structure, there are one head, and six specialists.

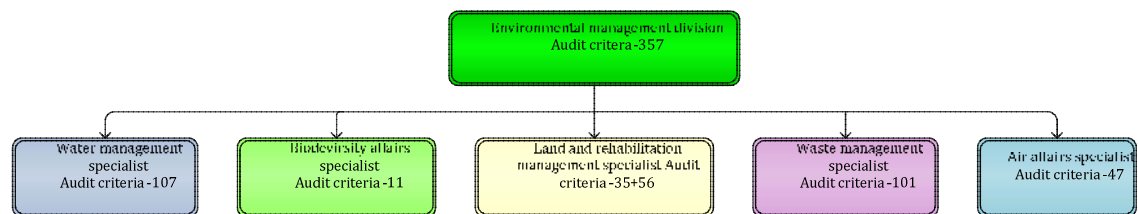


Figure 5.4 Second option of Environmental management division

The above factors were taken into account of designing the second option and what is more rehabilitation, soil and land management and was integrated. Moreover, the division is composed of six members, of whom one head of the division and five specialists.

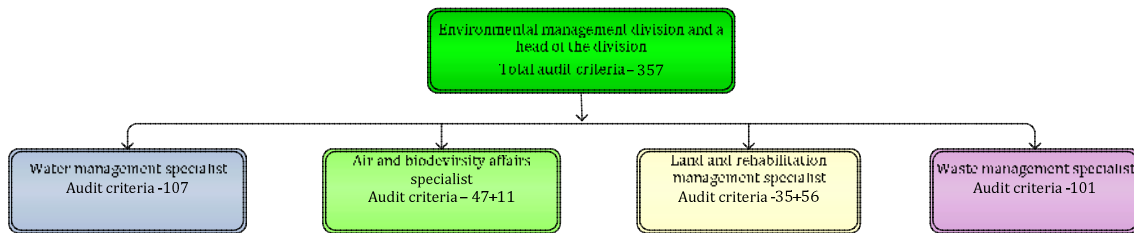


Figure 5.5 Ther third option of the Environmental management division

The third option of the organizational chart is brief and it can be used for employee reduction. But the option is not suitable for tasks in charge of and the division is composed of 5 members, including one head and four specialists. When the head is respoble for air quality and biodevirsiy affairs and it can be similar with the second option.

The head of the division will work under the direct management of the CEO in any case of these three options and can be a member of the Board of Directors or Administrative Board. This enhances to present the work performance of the division and be solved the financial affairs.

Water management specialist is obligingly required under the organizational chart and this relation acts under the Law on Water. Moreover, the tasks with 107 audit criteria will be implemented in accordance with the job description. Moreover, the waste management specialist is required and the tasks with 101 audit criteria will be performed. The waste management specialist can be responsible for chemical substance matters if requires.

However the audit criteria for other position is comparatively less, they should be closely connected with the every day operation and environmental safeguard policies.

Specialized training

It is necessary to improve current qualification, knowledge, competency of the environmental specialists of the company and get trained them in accordance with the proposed structure. To achieve the requirements, they should be involved in the following trainings:

- ~ Every business entity and organization is obliged to introduce environmental internal audit system within the newly developing environmental audit. In order to achieve this target, involve the environmental specialist in environmental audit special training in 2015 and the participantsshould be assigned as internal auditors of the company.
- ~ Involve them in postgraduate studies for master degree and specialized trainings due to the proposed work assignments
- ~ Involve the senior specialist and the head of the department in EMS training or support to get higher science degree in management field.

5.4.Action plan on environmental and social management system improvement

Following EMS improvement plans proposed based on ETT current situation and resources which outlined below and the requirements of international financing institutions, especially which of the World Bank.

Any business entities and organizations engaged in industry and services using mining and environmental resources normally develop continuous improvable, closely correlative activities in three time framed as below:

- ~ Short Up to 3 years
- ~ Medium 3-10 years
- ~ Long Over 10 years

In addition, the following are considered in areas where activities:

1. Environmental Management System
2. Public participation
3. Environmental mitigation measures

As the company has recently started operations, the environmental activities have not systemized and fine assigned yet, therefore following actions are recommended:

- ~ 29 high priority measures to be implemented in near future
- ~ 7 medium term measures to be implemented on the basis of first outcomes
- ~ 3 long term measures to be implemented on the basis of previous achieved outcomes.

The implementation of the environmental protection policy of the company will improve in medium term of periods if the above measures are implemented systematically.

Moreover, the company's environmental measures to be taken should not be limited by these, but also maintaining any initiations of the internal departments and specialists will be the fundament of enhancing of the EMS.

Besides, the implementing period can be changed in relation with the company finance and management.

In the execution of the project engineers and technical staff with feedback and advice. Also Tsogttetsii sum workshop will be organized by 44 members. Discussions Erdenes TT policy information on the environmental aspects of how the majority of the participants in that moderately satisfied, and obtained enough said. (Figure 5.6). Most of the participants about the air quality management said it is insufficient and have little understanding of Tsogttsegsii facing areas are considered to be related to coal dust.

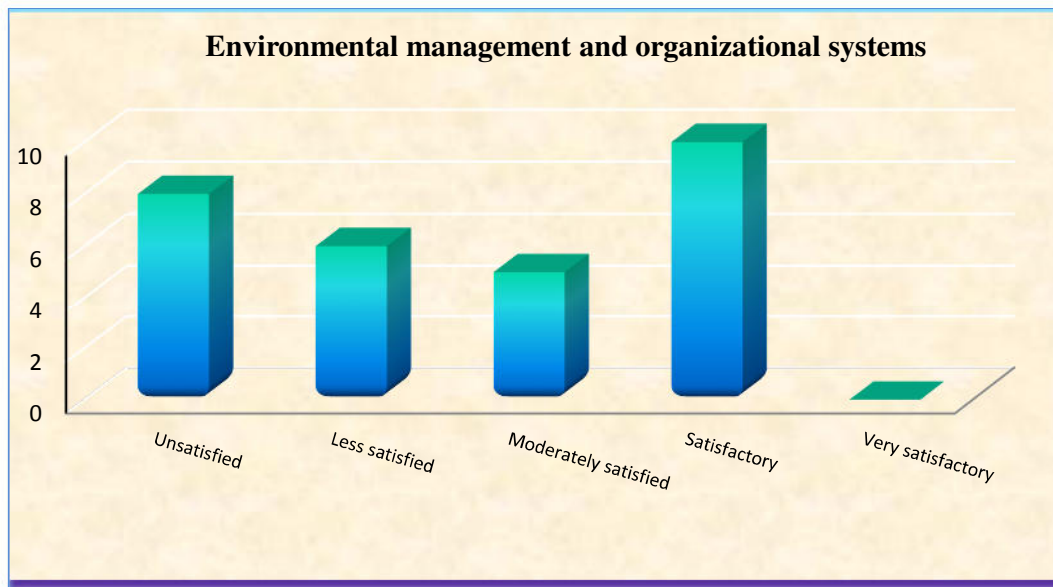


Figure 5.6. ETT’s environment, participants received information (Environmental management and organizational systems)

Deputy head of the soum representing participants in the discussion Kh.Gerelmaa gave feedback. She said that “Good afternoon everyone. As a result of the study is satisfied. This project of ETT is focused on the work of local life is so grateful to be a lot of information that has been included. Government policy on the road and coal processing. Only raw coal to enriching the existing plant will include a recommendation is made and this has to be given. The nature of the restoration of the environment itself is used to plant trees. I want in my soum will build Green Tree Wall.”

Discussion of the proposal and make a plan of action reflected the recommendations are presented in Table 5.8.

Environmental and social action plan to improve the management system

Table 5.8

№	Actions	Goal	Scope	Responsibility	Cost million.tug	Total expense million.tug	Implementation period	Frequency	Performance Indicator
Environmental management system									
Short-term activities									
1	As Law on Environment was amended in 2012 онд, Regulation on Environmental Audit was approved in 2013 and the mining operation commenced in 2011, so an environmental audit is to be conducted as including main and supporting activities in accordance with the Article 101 of the EPL in 2015	Environmental performance and compliance monitoring and review shall be undertaken and outlined by national independent professional institution within the national legislations	All activities related to environment	Environmental manager	80.0-90.0	80.0-90.0	2015	Once in every 2 years	Audit report, recommendation to improve the non-compliances
2	Install more groundwater monitoring wells or points of mine	Determine the groundwater level and quality scientifically and control changes	Mine site	Specialist in charge of water	Quotation price of awarded tender	Proposal for bidding	2015	Every year if requires	all well-equipped monitoring boreholes
3	Create an environmental space-time printed and digital database which cover the mine site, its impact zones and nearby territory	Create a combined database and use it for decision making	Mine site, its impact zones and nearby territory	Environmental manager	15.0	15.0	2016	Once	Printed and digital database, use of ArcGIS program
4	Update the environmental monitoring and research parameters adherence to the Mongolian standards	Determine an intensity of impacts and control	Monitoring points	Specialists in charge of environmental aspects	Domestic	Domestic	2015	When related standard is amended	Monitoring renewed checklist

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		environmental pollution							
5	Well assign duties for specialists in charge of environment	Prepare qualified human resources	Company	Environmental manager	domestic	domestic	2015	Once	Assignments of specialist should be clear in accordance with proposed organizational structure
6	Involve employees in specialization and professional trainings on regular basis	Involve in trainings related to proposed structure and improve their knowledge	Company	Environmental manager	Each specialist 2.0	14.0	2015-2016	Nonstop	Skills, knowledge and performance of specialists must be improved
7	Introduce a complex EMS	Introduce the proposed system into environmental policy	Company	Environmental manager	domestic	domestic	2015	Once	Be aware of the proposed system and take first steps to implement
8	The unit in charge of implementing environment policy should be separate from Occupational safety (OS) department in the organizational structure	Maintain an constant implementation of the Environmental protection policy and step up the company reputation	Company	Board of Directors, CEO	domestic	domestic	2016	Once	Establish an unit in the organizational structure
9	Create an Environmental legal database	Ensure the legal compliance and prevent from risks and noncompliance	Company	Environmental manager and lawyer	Purchase related standards	Purchase related standards	2015	Once	Create legal printed and digital database
10	Renew job descriptions of environmental officer, the employees need better specialization and stricter requirements for work places are required	Make the employees skilled and improve the work efficiency	Company	Environmental manager and lawyer	domestic	domestic	2015	Once	Job descriptions are to be renewed and approved

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11	Operational manuals, utilization of environmental device	Improve the accuracy of study or examination findings and verify	Company	Environmental manager	Quotation price of awarded tender	Proposal for bidding	2015	Every year	Operational manuals must be prepared in native tongue and obtain verification certificates
12	Verification of environmental device and equipment shall be made or developed by professional institution	Improve the accuracy of study or examination findings and verify	Company	Environmental manager	Invoice	Invoice	2015	Every year	Operational manuals must be prepared in native tongue and obtain verification certificates
13	Short, medium, long term management plans for environmental components should be developed and applied	Systemize and maintain the correlation of Environmental protection policy	Company	Environmental manager	Domestic	Domestic	2015	Renew on yearly basis	Management plan is to be developed, approved and applied
14	The amount loaded per a coal transportation truck should regularly maintain in accordance with the auto road capacity and build a monitoring point used for loading period, and then it should be examined by the independent organization.	Solve dust problem caused by transportation and complaints from local residents and mitigate environmental adverse impacts	The Ministry of Transportation	CEO	Quotation price of awarded tender	Proposal for bidding	2015-2016	Regular	The loading amount should be maintained in applicable standard, a monitoring point be build and cooperate with independent organization
15	Introduce environmental internal audit system, in order to achieve above, involve the environmental specialist in environmental audit special training	Improve environmental protection activities	Mine	Environmental manager	1.5	10.5	2015-2016	Once	Involve in training and obtain auditor certificate
16	Quality control should be taken on environmental activities of the Contractor companies through an internal auditor of the company	Control environmental activities of the Contractors	Company	Environmental manager	Domestic	Domestic	2016	Regular	Agreements made by the internal audit report and the response message

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17	Implement additional guidelines to reduce the negative effects of EMP in this report	EMP upgrade	Company	Environmental manager	Domestic	Domestic	2015	Regular	Increase the scope of the EMP
18	Inform any environmental activities and reports to the public openly	Ensure an information disclosure	Company	Environmental manager	Domestic	Domestic	2015	Regular	Information can be assessed to citizens via a website and other ways
19	Ensure the environmental safeguard requirements, specified in the international financial institutions' safeguard policies, underlined in this report	Improve Environmental protection policy and activities	Company	Environmental manager	Domestic	Domestic	2016	Regular	A worksheet that comprises donor organization's requirements is to created and monitoring system over its application should be developed
20	Each natural component of short, medium and long-term development of EMP	Monitoring and security policy in a process of systematic	Company	Environmental manager	Domestic	Domestic	2016	Regular	EMP developed and approved
21	The company's environmental management system, the management of short-term or half-day of training	Expansion of the concept of environment	Company	Environmental manager	Domestic	Domestic	2015	Regular	Leaders trained and wider understanding
22	One late coal loading capacity goes beyond the machine paved road. This has paved the road carrying capacity, and was based on a fault. This coal transport through the soil, and further, the resultant dust retail volume was not yet fully resolved. Therefore, construction of availability of the vehicle and ground transport stop	To keep a truck load shipments norm Soil transport stop Transport-induced suppression	Road transport	CEO and Environmental manager	Domestic	Domestic	2015	Paved road improvements each year	<ul style="list-style-type: none"> • Carrying coal shipments are norms • Use of tracks to be stopped • Paved roads to be improved • Transportation is done by paved road

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23	To undertake a DEIA for the activities of auxiliary facilities such as workers' camp, transportation road, electrical lines, maintenance shop and Fuel station besides the main activity of the mine	Evaluate the mining impacts properly	Company	Environmental manager	Quotation price of awarded tender	Proposal for bidding	Within 5 years	Renew in every 5 years	The assessment report and EMP approved by the Ministry of Environmental and Green Development
Medium term activities									
24	In order to determine the integrated environmental cumulative impacts of the companies - ETT, Energy Resources LLC and local TT, where those conduct mining operation in same location, a cumulative impact assessment should be undertaken with their joint efforts in accordance with the Article 6 of the law on EIA by professional institution	Ensure the related law enforcement and determine the impacts of each companies and the integrated cumulative impacts	The above three companies	Joint working group	Equally divide a quotation price into 3 or put imposition by certain portion depend on their mining area and timing	Proposal for bidding	In 5 years	Once in every 10 years	A cumulative impact assessment report approved by the Ministry of Environment and Green Development
25	Soften groundwater for drinking water in accordance with the standard	Mitigate or eliminate indirect impacts derived from water transportation, and supply the drinking and household water consumption of the population	Mine	Specialist in charge of water	Quotation price of awarded tender	Proposal for bidding	Within 5 years	Once	Water transportation should be stopped and groundwater be softened and purified and distributed in bottles
26	Plan a land use and site layout or arrangement which can ensure the sustainability related to long term mining	Develop a site combined layout/ arrangement and stop a resettlement of the facilities	Mine	Mineral surveyor and environmental manager	Domestic	Domestic	Within 5 years	Once	A village, jointly organized with the presence of main company and the Contractors should

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									be established, and voluntary use of the land in the licensed are must be halted
27	Maintain a constant use of environmental management complex system	Closely coordinate the recommended system with the Environmental policy	Company	Environmental manager	Domestic	Domestic	2018-2022	Regular	Usage of the proposed system should be stabilized
28	Expand a cooperation on environmental matters with the soum and community, while cooperating, maintain a policy directed not only in a level of governors but also the local community	Enhance a truly delivery of information and improve the company reputation	Company	Environmental manager	Domestic	Domestic	Regular	Regular	Channels to deliver complete information to the citizens should be created and the numbers of works on the field of cooperating local communities be increased.
29	Conduct national and international environmental audits and improve the activities due to their conclusion and recommendation	Independent audit should be performed and environmental protection activities be evaluated	Quotation price of awarded tender	Proposal for bidding	Quotation price of awarded tender	Proposal for bidding	Regular	Regular	Audit conclusion, recommendation and reports of performed action upon their recommendation
Long term activities									
30	Adopt a comprehensive environmental management system completely	The recommended system should be a basis of the environmental policy	Company	Environmental manager	Domestic	Domestic	2022 and further	Regular	Application of the proposed system must be renewed and adopted

Review of the Tavan Tolgoi Environmental and Social Management System

31	When the environmental activities are stabilized, the human resources are fully prepared and these are recognized by audit conclusions, the unit in charge of environmental policy can be reunited with OS department.	Maintain a sustainable implementation of the environmental protection policy and raise the company reputation	Company	Board of Directors, CEO	Domestic	Domestic	2022 and further	Once	The units can be reunited
32	Develop the mine complete and partial closures and work on it as one of the guiding direction	Minimize and eliminate potential environmental adverse impacts mine post closure	Company	Environmental manager	Domestic	Domestic	2022 and further	Regular	Plan is to be approved and implemented
Public Participation									
Short-term activities									
33	Community-oriented periodicals and subscription programs, and expand based on real cooperation	Corporate social responsibility	Local residents	Strategy and planning department	10.0	30.0	2015	Regular	Public understanding of the operations is getting better
34	Information on the official website of the company and society's website, subscription broadcast to expand	Corporate social responsibility	Local residents	Strategy and planning department	10.0	30.0	2016	Regular	Public understanding of the operations is getting better
Medium term activities									
35	Training of local communities, and promote vocational training centers	The number of permanent employees exposed	Local residents	HR and Administration department	domestic	domestic	2015-2016	Establish job resources	Improved human resource capacity.
36	Workplace focused on mentoring through local community policing	The number of permanent employees exposed	Local residents	HR and Administration department	domestic	domestic	2016-2017	Establish job resources	Improved human resource capacity.
Long term activities									
37	Build the employee housing	Improve workers' social status	Company	Strategy and planning department	Budgeted funds	Budgeted funds	2015	Annual budgets	Improve worker productivity

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38	Local residents in social care, education, school construction	Improve workers' social status	Company	Strategy and planning department	Budgeted funds	Budgeted funds	2015	Annual budgets	Improve worker productivity
Environmental mitigation measures									
Short-term activities									
1	Improve sealing of abandoned boreholes and ensure safety conditions to keep away from foreign objects	Protect groundwater against pollution	Mine site	Specialist in charge of water	1.0	1.0	2015	Once	Boreholes, well equipped and commissioned or accepted by internal and external inspection commissions
2	Investigate rain flood flow inside and/or outside the mine licensed site and identify a location of water reservoir	Prevent from flood, identify proper location of water reservoir	Mine site	Specialist in charge of water	7.0	7.0	2015	Once	Research finding, water reservoir location
3	Mine impact zones should be identified by each environmental components with a help of professional institutions	Determine space to implement safeguard policies	Mine	Environmental manager	For each environmental field 5.0	30.0	2015	Once	Impact zone layout and report
4	Relocate environmental monitoring study points and stockpiling of topsoil scientifically	Improve scientific basis of the monitoring study findings	Mine	Environmental manager	For each environmental field 5.0	30.0	2015	Once	Study report and relocated monitoring points if requires
5	Store or place hazardous wastes-lubricating materials in the cemented, geo-membrane or rubbery sites surrounding fences, that water-resistant layered and protected from seepage	Protect soil, underground from contamination and pollution	Mine site	Specialist in charge of waste issues	Quotation price of awarded tender	Proposal for bidding	2015	Once	Store hazardous wastes in a facility where meets related standards requirements
6	Increase capacity of the auto repair shop (space) or reconstruct and install lifting equipment for heavy parts	Construct auto repair complex and build work crew	Company	CEO, Environmental manager	Quotation price of awarded tender	Proposal for bidding	2015-2016	Once	Auto repair shop with bigger capacity and lifting equipment for heavy parts is to

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									be constructed and work crew should be built
7	Repair the broken road	Ensure safety and protect environment	The Ministry of Transportation	CEO	Quotation price of awarded tender	Proposal for bidding	2015-2016	Regular	The entire road repaired
8	Surrounding comprehensive studies of fauna	Environmental protection policy and to create a database	Mining areas, regions affected by the mine and its surrounding areas	Officer in charge of the biological	Quotation price of awarded tender	Proposal for bidding	2015-2016	Renew in every 5 years	Fauna comprehensive information and materials

Time management for implementation of operation action plan

The fundamental of maintaining a consistent implementation of the ESMS model proposed in this report is related to issues on the structure of the department in charge of environmental aspects, its management, and skills, knowledge of the specialists.

Implementation period of operation action plan of the ESMS

Table 5.9

ID	2015				2016				2017				2018				2019				2020				2021				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
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38	█				█				█				█				█				█				█							

Environmental mitigation plan

Table 5.10

ID	2015				2016				2017				2018				2019				2020				2021				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	[Redacted]																															
2	[Redacted]																															
3	[Redacted]																															
4	[Redacted]																															
5	[Redacted]																															
6	[Redacted]																															
7	[Redacted]																															
8	[Redacted]																															

As concluded, a good consideration of our proposed operation action plan and an awareness of importance of the issues on the structure of the department in charge of environmental aspects, its management and skills, knowledge of the specialists is essential to future achievement. The environmental unit can succeed its commitment in the environmental field of the company without difficulties if the management team focuses on this direction and solves relevant issues.

APPENDIX I

Survey name: Questionnaire for local residents	
A. Introduction	
<p><i>How are you? Mining operation of East Tsankhi coalmine is performed by ETT. The objective of the survey is to collect necessary information for social impact assessment of EET.</i></p> <p>Notice of information security: <i>Your opinion is highly appreciated in our further operation if you kindly express your opinion. Information security will be kept. Questionnaire is only used for social impact study.</i></p> <p><i>Please circle the numbers of correct answers or fill in the empty space after you read the following questions.</i></p>	
B. Personal information	
1. Age:	
2. Gender	
<ul style="list-style-type: none"> 1. Male 2. Female 	
3. Educational stage	
<ul style="list-style-type: none"> 1. Bachelor degree or above 2. Diploma education 3. Vocational education 4. Upper-secondary education 	<ul style="list-style-type: none"> 5. Lower-secondary education or ninth grade graduation 6. Primary education or 5th grade graduation 7. Illiberal 8. Dropout /lower than 5th grade graduation/
4. Employment	
<ul style="list-style-type: none"> 1. State organization 2. Non-governmental and civil society organization 3. School and educational organization 4. Herder 	<ul style="list-style-type: none"> 5. Student 6. Private entity 7. Retiree 8. Other.....
5. Accommodation type	
<ul style="list-style-type: none"> 1. Ger, traditional accommodation 2. Ger and house 3. Appartment 	<ul style="list-style-type: none"> 4. Rental apartment 5. Barn 6. Street 7. Other.....
6. Accommodation ownership	
<ul style="list-style-type: none"> 1. Private property 2. Rent 	<ul style="list-style-type: none"> 3. Others' property 4. Other
7. Number of family member:	
.....	
8. Number of children under 18 years of age:	
9. Number of employees in household:	
10. How much was your household income approximately in 2013? /Tugriks/	
<ul style="list-style-type: none"> 1. 0-500'000 	<ul style="list-style-type: none"> 4. 3'000'000-4'999'999

2. 500'001-999'999	5. 5'000'000-9'999'999																				
3. 1'000'000-2'999'999	6. At least 10'000'000																				
B. Questions of soum conditions																					
11. How satisfied are you with soum's following issues?																					
	Absolutely unsatisfactory	Unsatisfactory	Moderately satisfactory	Satisfactory	Absolutely satisfactory																
A. Social service																					
Drinking water supply	1	2	3	4	5																
Education service	1	2	3	4	5																
Waste management	1	2	3	4	5																
Power supply	1	2	3	4	5																
State service	1	2	3	4	5																
Communication	1	2	3	4	5																
B. Health service																					
Hospital capacity	1	2	3	4	5																
Hospital ratio	1	2	3	4	5																
Service quality	1	2	3	4	5																
C. Transportation																					
Road and infrastructure	1	2	3	4	5																
Communication /phone/	1	2	3	4	5																
12. How urgent are following problems for your soum /choose up to 3 answers/																					
<table border="0"> <tr> <td>1. Crime</td> <td>9. Corruption issues</td> </tr> <tr> <td>2. Poverty</td> <td>10. Environmental issues including air, water, waste and etc</td> </tr> <tr> <td>3. Economic crisis</td> <td>11. Health issues</td> </tr> <tr> <td>4. Unemployment</td> <td>12. Natural disaster</td> </tr> <tr> <td>5. Drinking water shortage</td> <td>13. Other:</td> </tr> <tr> <td>6. Discrimination</td> <td></td> </tr> <tr> <td>7. Local governance capacity</td> <td></td> </tr> <tr> <td>8. Political issues</td> <td></td> </tr> </table>						1. Crime	9. Corruption issues	2. Poverty	10. Environmental issues including air, water, waste and etc	3. Economic crisis	11. Health issues	4. Unemployment	12. Natural disaster	5. Drinking water shortage	13. Other:	6. Discrimination		7. Local governance capacity		8. Political issues	
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5. Drinking water shortage	13. Other:																				
6. Discrimination																					
7. Local governance capacity																					
8. Political issues																					
D. Relevant project information																					
13. How much information do you get about mining of ETT East Tsankhi coalmine?																					
<ol style="list-style-type: none"> 1. Good enough understanding and information 2. Slight information 3. No information 																					
14. What is source of the project, if you have some information?																					
<ol style="list-style-type: none"> 1. Television 2. Newspaper 3. Internet 4. Radio 5. Public rumors 6. This questionnaire 7. Other: 																					
15. Do you promote East Tsankhi mining?																					

1. Yes 2. No			
16. What is a reason, if you promote East Tsankhi mining? /choose up to 2 answers/			
1. State economic efficiency 2. Regional development 3. Possibility of local citizens' employment 4. Improvement in public health and education		5. Improvement of household livelihood 6. Infrastructure improvement 7. Possibility of running business 8. Other:	
17. What is a reason, if you oppose this project? /choose up to 2 answers/			
1. Anxiety and doubt about mining technology, which is poorly developed 2. Means of money laundering 3. Adverse impact on environment and ecology 4. Shortage of natural resources 5. Adverse impact on public health 6. Adverse impact caused by migration growth 7. Adverse impact on livestock industry 8. Inefficiency for local citizens' 9. Adverse impact on cultural heritage and traditional custom 10. Other:.....			
18. How do you worried about following issues relevant to East Tsankhi project implementation in your local area?			
	Unworried	Slightly worried	Extremely worried
A. Environment			
Impact on water	1	3	5
Air pollution	1	3	5
Natural resource exploitation /coal/	1	3	5
Gobi desert and soil erosion	1	3	5
Plant type	1	3	5
Waste management	1	3	5
Other: /write/	1	3	5
B. Society			
Healthcare	1	3	5
Public health			
Crime	1	3	5
Citizens' livelihood	1	3	5
Conflicts of society and culture	1	3	5
Traffic growth	1	3	5
Immigration	1	3	5
Entity capacity /ETT/	1	3	5
Political issues	1	3	5
Educational issues	1	3	5
Other:	1	3	5

19. Do you agree following issues? As East Tsankhi mining is intensified:				
Positive possibilities	Agree	Disagree	Don't know	
Beneficial impact on state economic development	1	2	3	
Hugely beneficial impact on gobi desert regional development	1	2	3	
Hugely beneficial impact on Tsogttsetsii soum development	1	2	3	
Employment rate growth and citizens' income	1	2	3	
Opportunity and condition of running small and medium-sized enterprises, services and businesses	1	2	3	
Negative attitudes				
Adverse impact on gobi desert regional environment, ecosystem and animals	1	2	3	
Adverse impact on herders' life in mining area	1	2	3	
Adverse impact on local residents' health	1	2	3	
Crime and other adversely social impacts, influenced by residents' migration from other local areas	1	2	3	
20. Some entities perform operation in TT coal deposit of Tsogttsestii soum. Please compare and evaluate these entities as following indicators.				
		Good	Fair	Bad
Social responsibility of the entity	Local TT	1	2	3
	Erdenes MGL	1	2	3
	Energy Resource	1	2	3
Contribution and investment, which is efficient to local development	Local TT	1	2	3
	Erdenes MGL	1	2	3
	Energy Resource	1	2	3
Providing local citizens' with job opportunity	Local TT	1	2	3
	Erdenes MGL	1	2	3
	Energy Resource	1	2	3
Mining area rehabilitation and environmental protection	Local TT	1	2	3
	Erdenes MGL	1	2	3
	Energy Resource	1	2	3
Techniques used by the entities	Local TT	1	2	3
	Erdenes MGL	1	2	3
	Energy Resource	1	2	3
Focus on social issues in local area /education, health and etc/	Local TT	1	2	3
	Erdenes MGL	1	2	3
	Energy Resource	1	2	3
	Local TT	1	2	3

	Erdenes MGL	1	2	3
	Energy Resource	1	2	3
21. What are your and local citizens' issues addressing to Erdenes MGL? What do you think that Erdenes MGL should focus on what to perform operation?				

LIST OF MONGOLIAN LAWS AND LEGISLATION

I. Environmental management and Organizational management

Table ii

№	Titles of Laws and Regulations
IA-International Treaties and convention	
1	IA-Statute of the International Renewable Energy Agency
NP- National program	
1	NP- National Program for Public Ecological Education
2	NP-National program for quality and environmental management support
3	NP- National program for public education in sustainable development
4	NP- State Ecological Policy
5	NP-National Security of Mongolia
6	NP- Comprehensive Development Strategy of Mongolia
LoM-Laws of Mongolia	
1	LoM-The Constitution of Mongolia
2	LoM-Law of Mongolia on Licensing
3	LoM-Procedure to regulation following to the Mineral Laws
4	LoM-Procedure to following regulation to the Amendment Law to the Minerals Law
5	LoM-The Minerals law of Mongolia
6	LoM-The Law on Prohibition of Granting Exploration Licences-2010.06
7	LoM-The Law on Prohibition of Granting Exploration Licences-2011.02
8	LoM-The Law on Prohibition of Granting Exploration Licences-2011.06
9	LoM-The Law on Prohibition of Granting Exploration Licences-2012.01
10	LoM- Law on payment for using Natural Resource
11	LoM-Law on Environmental Impact Assessment
12	LoM-Nature Environment Protection Law
13	LoM-Petroleum Products Law
14	LoM-The Law on Petroleum. (with new revision)
15	LoM-Law of Mongolia on Land fees
16	LoM-Law on Geodesy and Cartography
17	LoM-Cadastral Mapping and Land Cadastre Law
18	LoM-Law on Concession
19	LoM-LAW ON ALLOCATION OF LAND TO MONGOLIAN CITIZENS FOR OWNERSHIP
20	LoM-Procedure to following regulation to the implementing LAW ON ALLOCATION OF LAND TO MONGOLIAN CITIZENS FOR OWNERSHIP
21	LoM-Law on Border
22	LoM-Law of Mongolia on Renewable Energy
23	LoM-Nuclear Energy Law
24	LoM-Law of Mongolia on Energy
25	LoM-Criminal Law
26	LoM- Law of Mongolia on Common Minerals
DoP-Decree of the President	
1	DoP- Decree #84 on support for decision to purify the initiative environment
2	DoP-Decree #39 on control for petroleum related activities
PoM-Parliamentary Resolutions and decrees	
1	PoM-Resolution #20 on measures to implement the Environmental Impact Assessment Laws
2	PoM-Resolution #31on measures to implement the package of Environmental Law
3	PoM-Resolution #3 on about some regulations in nature environment
4	PoM-Resolution #38 on about some regulations in nature environment

5	PoM-Resolution #43 on about some regulations in nature environment
6	PoM-Resolution #26 on measures to implement the Law on Land Fees
7	PoM-Regulation #57 on about Oyu Tolgoi investment agreement
8	PoM-Resolution #39 on about some regulations in Tavan Tolgoi coal deposit
9	PoM-Resolution #27 on Registering some mine deposits into the list of strategic importance
10	PoM-Resolution #106. Regulation on approval of state ecological policy
11	PoM-Resolution #43 about to approve Green Development Policy
12	PoM-Resolution #74 on some regulations within approved Minerals Law
13	PoM-Resolution No 32 about to approve National Renewable Energy Program
14	PoM-Resolution #80 on some regulations within approved Energy Law
GoM-Governmental resolutions and decrees	
1	GoM-procedure to collect fee income for environmental protection
2	GoM-Environmental database
3	GoM-Procedure for Environmental impact assessment
4	GoM-Procedure to grant entities introduced environmentally-friendly technologies
5	GoM-A list of eco-friendly technology
OoM-Order of Minister	
1	OoM-method and instruction of Environmental Impact Assessment -2010
2	OoM-nature Environmental damage assessment and recovery calculation methods - A-156
3	OoM-Nature Environmental damage assessment and recovery calculation methods - A-157
4	OoM-Ecology and economic assessment to estimate damages within changing purpose in Special Protected Area- A-333
5	OoM-Ecological damage calculation methodology and ecology-economic assessment of damage in mineral extraction and processing -207
6	OoM-Procedure to report, control, approve and process Environmental management plans
7	OoM-Procedure to grant citizens who detected and informed real information about illegal activities against environmental laws and decree
8	OoM-Procedure of Environmental Office
9	OoM- To ensure public participation into environmental impact assessment
10	OoM-procedure to analyse of environmental impact assessment-195
11	OoM-procedure to cash collateral for nature environment protection
12	OoM-procedure to control for selling wood, wooden raw materials and fuelwood in the capital, provincial centers and other urban areas
13	OoM-procedure to issue exploration license
14	OoM-issue special license to business owners who has food and agricultural special grants permission
15	OoM-Procedure to control for special account transaction of nature environment recycling guarantee
16	OoM-Memorandum for state regulation in state border area nature environment protection
17	OoM-implemenation and monitoring of environmental impact assessment-87
18	OoM-procedure to analyse of environmental impact assessment
19	OoM-Committee regulation in environmental impact assessment-119
20	OoM-Guideline to process of environmental protection plan and environmental control, analysing program-87
OS-Order of Suprevisor Agency	
1	OS-Procedure to regulate some activities implementing Mineral Laws of Mongolia
2	OS-content of mineral deposit exploration result report and requirements fot it
3	OS-Procedure for submitting application requesting exploration and mining license, transferring and extension of the term of an exploration and mining license
4	OS-Issue certificate for land owning and use
5	OS-Procedure to control and issue license to carry out activities in border area and region from citizens, entities and organizations
6	OS-Methodology to estimate sales assessment of mining export products

7	OS-About works of Samples
S- MNSStandard	
1	S-MNS5600 : 2008 National eco-label. Form, sizes and technical requirements
2	S-MNS4219 : 1994 System of standards for environment protection. Ecological passport of entity. Basic rule
3	S-MNS ISO 14001 : 2005 Environmental management systems -- Specification with guidance for use
4	S-MNS ISO 14024:1999 Environmental labels and declarations – Type -- environmental labeling. Principles and procedures
5	S-MNS ISO 14025 : 2004 Environmental labels and declaration - Type III environmental declarations. Technical Report
6	S-MNS ISO 14004 : 2005 Environmental management systems -- General guidelines on principles, systems and supporting techniques
7	S-MNS ISO 14015 : 2002 Environmental management -- Environmental assessment of sites and organization (EASO)
8	S-MNS ISO 14020 : 2004 Environmental labels and declarations. General principles
9	S-MNS ISO 14031 : 2001 Environmental management -- Environmental performance evaluation – Guidelines
10	S-MNS ISO 14048 : 2004 Environmental management -- Life cycle assessment -- Data documentation format
11	S-MNS ISO 14050 : 2005 Environmental management -- Vocabulary
12	S-MNS 4628 : 1998 Fuelling station. Building construction and general requirements of equipment
13	S-MNS ISO 19011 : 2003Guidelines for quality and/or – environmental management system auditing
14	S-MNS ISO 31000 : 2011.Risk management. Principles and model
15	S-MNS ISO 31010 : 2011.Risk management. Methods of Risk management
16	S-MNS ISO/TR 14061 : 2002 Information to assist forestry organizations in the use of Environmental Management System standards ISO 14001 and ISO 14004
17	S-MNS 4191 : 1993 System of standard for environment protection. Mongolian climate. Basic characteristic
18	S-MNS ISO-14064-1:2011 Greenhouse gas-1. Organizational level of greenhouse gas emissions and removals, and guidance on reporting

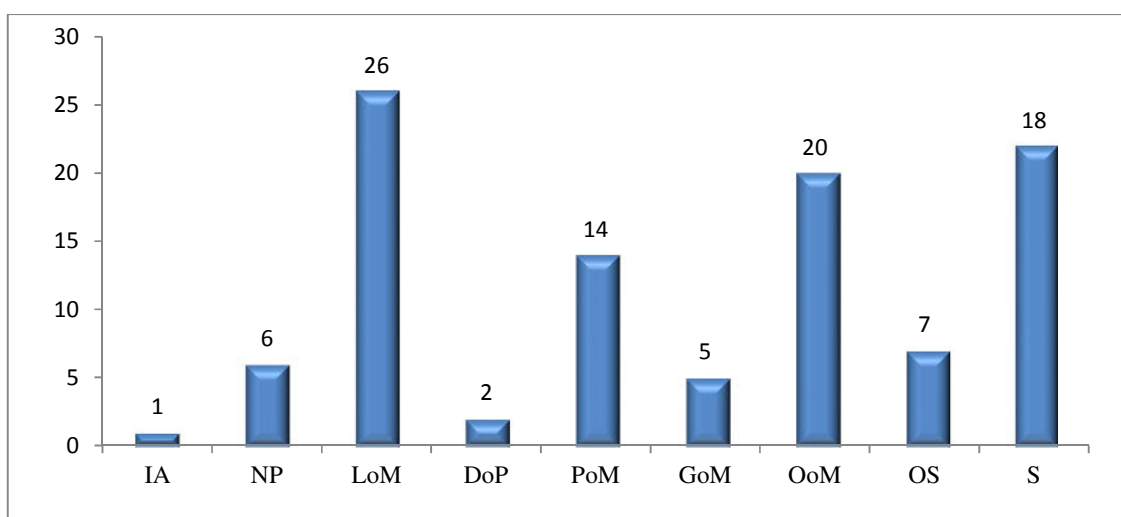


Figure i: The number of laws and rules in Nature Environment management

It is necessary to use the following legislation in improving water environment management and they should be used at the level of environmental department officer in charge of water aspects.

II. Water management

Table iii

№	Laws
NP-National Program	
1	NP- "Khatan Tuul" National Program
2	NP-"Water" National Program
3	NP- State Ecological Policy
4	NP-National Security of Mongolia
5	NP- Comprehensive Development Strategy of Mongolia
6	NP- National program for public education in sustainable development
7	NP- National Program for Public Ecological Education
LoM-Laws of Mongolia	
1	LoM-The Constitution of Mongolia
2	LoM-Law on hydrological, meteorological and environmental monitoring
3	LoM-Procedure to regulation following to the Mineral Laws
4	LoM-Minerals Law
5	LoM- Law on payment for using Natural Resource
6	LoM-Nature Environment Protection Law
7	LoM-Law on Prohibition of Mineral Exploration and Mining Activities in areas in the Headwaters of Rivers, Protected Water Reservoir Zones and Forested Areas
8	LoM-Procedure to implementing Law on Prohibition of Mineral Exploration and Mining Activities in areas in the Headwaters of Rivers, Protected Water Reservoir Zones and Forested Areas
9	LoM-Water Law
10	LoM-Water Pollution Fees Law
11	LoM-Law on Use of water supply and sewage system in urban and settlement areas
12	LoM-Criminal Law
13	LoM-Procedure to following regulation to the Amendment Law to the Minerals Law
14	LoM-Law on Environmental Impact Assessment (with new revision)
15	LoM-Law on Border
16	LoM- Laws on Common Minerals
PoM –Resolutions of theParliament of Mongolia	
1	PoM-Resolution #43 about to approve Green Development Policy
2	PoM-Resolution #106. Regulation on approval of state ecological policy
GoM- decrees and decisions of the Government of Mongolia	
1	GoM-Approval "Khatan Tuul" Program #203
2	GoM-to approve renewing water ecology economic assessment #302
3	GoM-Discount and determine water resource usage #326
4	GoM-about to build hydroelectric power station #375
5	GoM-Approval State Water Resources Management Plan #389
6	GoM-Modification of Annex #327-calculation coefficient for utilization
7	GoM-#65 to overturn the Resolution #256 2007-10-3
8	GoM-About activity for basin administration #254
9	GoM- Approval for concession agreement for Tuul Songino Water Resource Complex project #403
10	GoM-Border zone in areas in the Headwaters of Rivers, Protected Water Reservoir Zones and Forested Areas for Prohibition of Mineral Exploration and Mining Activities
11	GoM-Plan of Integrated water resources management

12	GoM-Action plan #2 for implementing National Water Program
OoM-Orders of Ministers	
1	OoM-Rules on protection of water resources preventing from pollution #143
2	OoM-Action activities and role of water professional organizations
3	OoM-Special and normal protection zone of water basin area and sanitary condition of water supply source zones
4	OoM-to approve template of agreement and voucher for water use and service fee of review on water usage
5	OoM-Procedure for use water flow counter on water use and consumption #A-156
6	OoM-about to reduce pollution of the Tuul river
7	OoM-Procedure for spring protection
8	OoM-Guideline on classification and category for receiving groundwater resource
9	OoM-Procedure for use cesspool for household dirty water
10	OoM-General procedure on own, use and financing for renewing and building water well with engineering construction
11	OoM-Rule of setting up water basin council
12	OoM-Procedure for drawing hydraulic structure and construction
13	OoM-Methodology to define service fee on a sewage drain and price of fresh water
OS-Order of Supervisor Agency	
1	OS-Procedure for issue technical condition on water supply and sanitation
2	OS-Rule for regulation on water supply and sewage service and usage
MNS-Standard	
1	S-MNS ISO 5667-7:2002 Water quality -- Sampling -- Part 7: Guidance on the design of water and steam in boiler plants
2	S-MNS ISO 5667-1:2002 Water quality -- Sampling -- Part 1: Guidance on the design of sampling programmes
3	S-MNS ISO 6107-8:2000 Water quality. Vocabulary. Part-8
4	S-MNS ISO 6107-7 : 2002 Water quality. Vocabulary Part-7
5	S-MNS ISO 6107-5:2000 Water quality. Vocabulary. Part-5
6	S-S-MNS ISS-MNS ISO 6107-4:2000 Water quality. Vocabulary. Part-4
7	S-MNS ISO 6107-3:2000 Water quality. Vocabulary. Part-3
8	S-MNS ISO 6107-2:2000 Water quality. Vocabulary. Part-2
9	S-MNS ISO 6107-1 : 2002 Water quality. Vocabulary
10	S-MNS ISO 5667-14 : 2000 Water quality -- Sampling -- Part 14: Guidance on quality assurance of environmental water sampling and handling
11	S-MNS ISO 5667-13:2000 Water quality. Sampling. Part 13: guidance on sampling of sludges from sewage and water-treatment works
12	S-MNS ISO 5667-11 : 2000 Water quality -- Sampling -- Part 11: Guidance on sampling of groundwaters
13	S-MNS ISO 5667-10:2001 Water quality -- Sampling -- Part 10: Guidance on sampling of waste waters
14	S-MNS ISO 5667-8:2000 Water quality -- Sampling -- Part 8: Guidance on the sampling of wet deposition
15	S-MNS ISO 5667-6 : 2001 Water quality -- Sampling -- Part 6: Guidance on sampling of rivers and streams
16	S-MNS ISO 5667-5:2001 Water quality -- Sampling -- Part 5: Guidance on sampling of drinking water and water used for food and beverage processing
17	S-MNS ISO 5667-4 : 2001 Water quality -- Sampling -- Part 4: Guidance on sampling from lakes, natural and man-made
18	S-S-MNS ISO 5667 : 3 Water quality. Sampling -Part 3. Recommendation on sampling processing and storage
19	S-MNS6148 : 2010 Water quality. Maximum limit of substance contaminating the ground water.

20	S-MNS5582 : 2006 Water quality. The raw waste water from the leather processing industry before the primary effluent threatment plant. Technical requirements
21	S-MNS4943 : 2000 Supply of treated wastewater to the environment. General Requirements
22	S-MNS4586 : 1998 Water quality. General requirements
23	S-MNS 4288 : 1995 General requirements for selecting a site for waste water treatment plants and treatment technologies and effectiveness
24	S-MNS4079 : 1988 Irrigation. Water quality. Terms and definitions
25	S-MNS4078 : 1988 Irrigation. Water melioration Terms and definitions
26	S-MNS4047 : 1988Water space. Control method of surface water quality
27	S-MNS3870 : 1986Continental hydrology. Terms and definitions
28	S-MNS3597 : 1983Water space. Common requirement protection of surface and underground water from fertilizer pollution
29	S-MNS3382 : 1982Hydro geology. Terms and definitions
30	S-MNS3342 : 1982Water space. Common requirement protection of underground water from pollution
31	S-MNS 0900 : 2005 10pQuality index of drinking water
32	S-MNS 0899 : 1992 Potable water supply for the source selection procedures and hygiene
33	S-MNS0359 : 1989Water economy. Term, Definition of fluid water
34	S-MNS 0017-1-1-14 : 1980Water space. Classification of water use
35	S-MNS 0017-1-1-10 : 1979Water use protection. Term. Definition
36	S-MNS 5775 : 2007Settlement area distribution service of drinking water General requirements
37	S-MNS 6279 : 2011 Water supply and sanitation facilities. Terms, Definition -Comment Dictionary
38	S-MNS 6390 : 2013 Treated wastewater from wool and cashmere processing industries to centralized system
39	S-MNS EN 12566-1:2011 Low-strength waste-water treatment facilities for population up to 50. Part-1. Precast plant
40	S-MNS EN 12566-2:2011 Low-strength waste-water treatment facilities for population up to 50. Part-2. Soil drains system
41	S-MNS EN 12566-3:2011 Low-strength waste-water treatment facilities for population up to 50. Part-3. Prefabricated and assembled on-site waste water treatment plant
42	S-MNS EN 12566-4:2011 Low-strength waste-water treatment facilities for population up to 50. Part-4. Flowing kit assembled on site using plant
43	S-MNS EN 12566-5:2011 Low-strength waste-water treatment facilities for population up to 50. Part-5. cleansing dirty filter system
44	MNS ISO 862:2000Surface active agents. Vocabulary

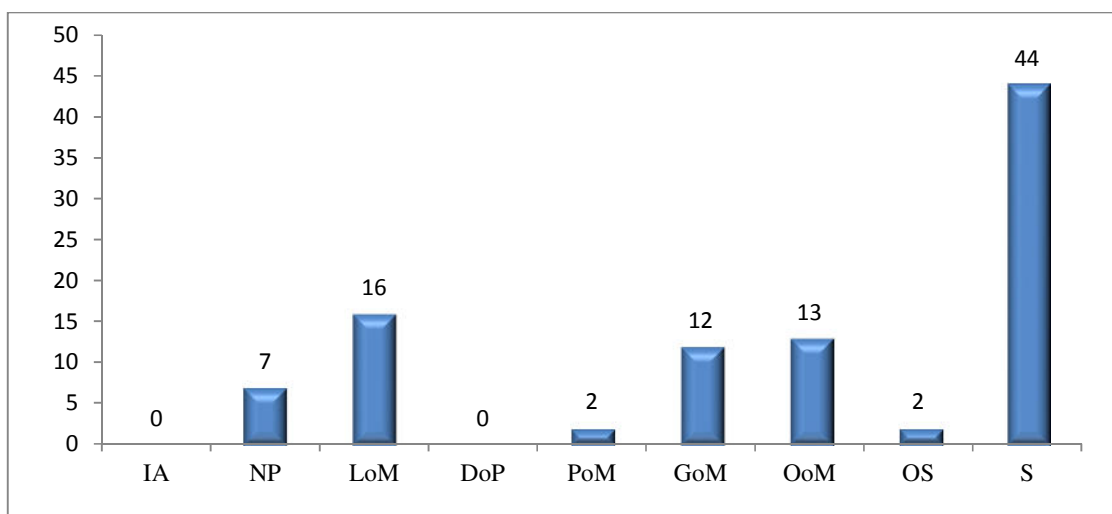


Figure ii: The number of laws and rules in Water management

It is necessary to use the following legislation in improving air, gas emission and climate management and they should be used at the level of environmental department officer in charge of air aspects.

III. Atmosphere and climate management*Table iv*

№	Laws
IA-International Treaties and conventions	
1	IA-The United Nations Framework Convention on Climate Change
2	IA-The Kyoto Protocol of the UN Framework Convention on Climate Change
3	IA-Convention on the Protection of the Ozone Layer
4	IA-Statute of the International Renewable Energy Agency
NP-National Program	
1	NP-National Action Programme on Climate Change
2	NP- National Program for Public Ecological Education
3	NP- State Ecological Policy
4	NP-National Security of Mongolia
5	NP- Comprehensive Development Strategy of Mongolia
6	NP- National program for public education in sustainable development
LoM-Mongolian Laws	
1	LoM-The Constitution of Mongolia
2	LoM-The Mongolian law on Air
3	LoM-Law on fees for air pollution
4	LoM- Law on payment for using Natural Resource
5	LoM-Law on Environmental Impact Assessment
6	LoM-Nature Environment Protection Law
7	LoM-Law on hydrological, meteorological and environmental monitoring
8	LoM-Procedure to regulation following to the Mineral Laws
9	LoM-Minerals Law
10	LoM-Procedure to following regulation to the Amendment Law to the Minerals Law
11	LoM-Law on Border
12	LoM-Criminal Law
13	LoM- Law of Mongolia on Common Minerals
14	LoM-Mongolian Law on the Capital City's Air Pollution Reduction
PoM-Regulations and Decrees of Ministries	
1	PoM-Resolution #11 for some activities with the adoption of Mongolian Law on the Capital City's Air Pollution Reduction
2	PoM-Regulations #02 for approve National Action Programme on Climate Change
3	PoM-Resolution #106. Regulation on approval of State Ecological Policy
4	PoM-Resolution No 32 about to approve National Renewable Energy Program
5	PoM-Resolution #80 on some regulations within approved Energy Law
6	PoM-Resolution #43 about to approve Green Development Policy
GoM-Governmental decrees and decisions	
1	GoM-Approval the procedure of determining the amount of payment. Air fee #273
2	GoM-Approval of Plan #317. Action plan in first stage implementation of National Action Programme on Climate Change
3	GoM-Procedure on importing and selling of regulates the import of ozone-depleting substances (ODSs) #104

4	GoM-Procedure on estimate electric price in ger area and Capital city's air pollution #309
5	GoM-Adoption of the list #227 air pollution. List of entities for free of charge from Air Pollution fee
6	GoM-Approval the rule #210. State rule for hydrological, meteorological and environmental monitoring
7	GoM-About the measures taken to reduce air pollution #18
8	GoM-About the measures taken to reduce air pollution #218
9	GoM-About the measures taken to reduce air pollution in near period #14
10	GoM-Procedure on regulation for citizen, entities and organizations in special zones for reducing air pollution
11	GoM-Program for developing hydrological, meteorological and environmental monitoring sector
12	GoM-Adoption of the national program #129. Program of Protecting the Ozone Layer
OoM-Order of Minister	
6.	OoM-Ambient air monitoring wages and determine the amount of duty #A 342
7.	OoM-Approval the list of organic solvents and billing of air pollution fee
8.	OoM-Rule of the professional organizations in charge of air quality, procedure for informing air quality information
9.	OoM-hydrological, meteorological quoted preliminary and procedural data types for special needs #16
10.	OoM-General procedure for informing and monitoring with Air quality index #53
S-MNSStandard	
1	S-MNS 0017-2-0-07 : 1979Waste to air pollution. Classification
2	S-MNS 0017-2-1-17 : 1980 Atmosphere. Vocabulary Waste of industry and pollution related to climate
3	S-MNS 0017-2-3-16 : 1988 Air space. Order controlled air property of populated area
4	S-MNS 3113 : 1981 Air space. Common requirement putting for Determination method of polluted matter of air
5	S-MNS 3384 : 1982 Air space. Common requirement putting to taking of part
6	S-MNS 4191 : 1993 System of standard for environment protection. Mongolian climate. Basic characteristic
7	S-MNS ISO 4226 : 2000 Air quality. General aspects. Units of measurement
8	S-MNS 4585 : 2007 Air quality. General requirements
9	S-MNS 5010 : 2001 General Requirements for measuring the dusting content in the air within workplace
10	S-MNS 5457 : 2005 Maximum acceptable level and measuring method of toxic elements (CO, SO ₂ , NO _x , ash) in the exhaust gases contents of heating boilers and home stoves
11	S-MNS 5885 : 2008Acceptable concentration of air pollutant elements. General technical requirements
12	S-MNS 5918 : 2008Environment. Re-vegetation of destroyed land. General technical requirements
13	S-MNS 6063 : 2010Air quality – Acceptable concentration of pollutant elements for atmospheric air in public area
14	S-MNS 6147 : 2010Environmental pollution, pollution control and protect – Maximum residue limit of pesticides in air and soil
15	S-MNS 6298 : 2011 New thermal power plant steam and water during operation of the furnace to heat the atmosphere of some air pollutants in the flue gas substances of maximum.
16	S-MNS ISO 8756 : 2000 Air quality. Handling of temperature, pressure and humidity data
17	S-MNS ISO 4225 : 2000 Air quality. General aspects. Vocabulary
18	S-MNS ISO 4227 : 2002 Planning of ambient air quality monitoring.
19	S-MNS 0017-5-1-21 : 1992Noise emitted by means of transport. Tolerance level of noise, method for measuring
20	S-MNS 3383 : 1982 Air space. Spring of pollution. Determination, formulation.
21	S-MNS 5013:2009Petrol engine vehicle – Maximum acceptable level and measuring method of exhaust emission

22	S-MNS 5014:2009 Diesel engine vehicles – Maximum acceptable level and measuring methods of opacity
23	S-MNS 5606-1:2006. Acceptable level of gas exhausts from crematorium with diesel fuel
24	S-MNS OIML R 103 : 2001 Measuring instrumentation for human response to vibration
25	S-MNS 17.2.1.01:78 Atmosphere. Toxic atmospheric pollutants from internal combustion engines. Terms
26	S-MNS 4994:2000 Occupational safety and health Vibration. Requirements for general safety
27	S-MNS 4995:2000 Occupational safety and health General requirements for the measurement of vibration
28	S-MNS 5002:2000 Occupational safety and health. Noise norms. General requirements for safety

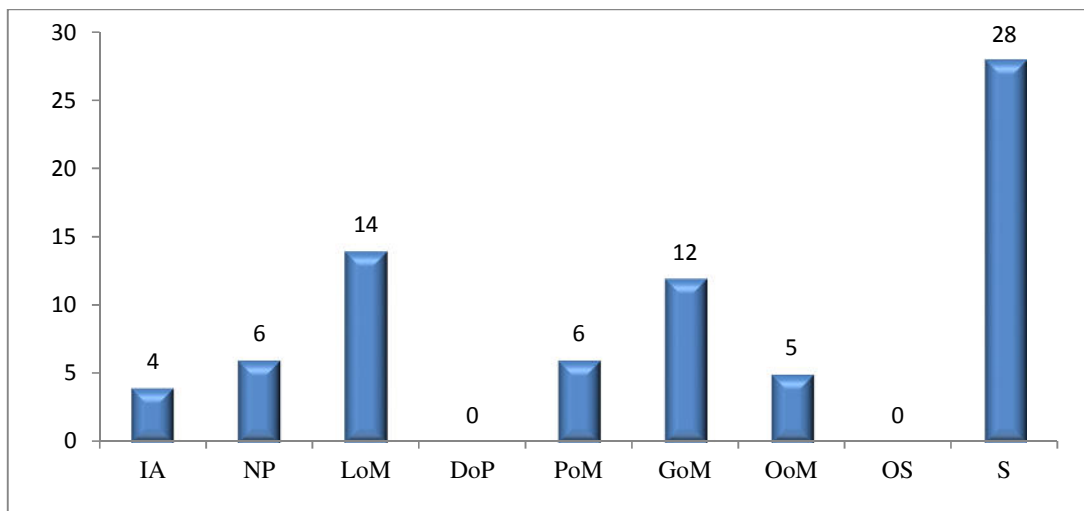


Figure iii: The number of laws and rules in Atmosphere and climate management

It is necessary to use the following legislation in improving soil environment and land management and they should be used at the level of environmental department officer.

IV. Soil environment and land management

Table v

N _o	Laws
IA-International Contract and convention	
1	IA-The United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa
NP-National Program	
1	NP-National Plan of Action to Combat Desertification
2	NP-National Programme On Persistent Organic Pollutants
3	NP- State Ecological Policy
4	NP-National Security of Mongolia
5	NP- Comprehensive Development Strategy of Mongolia
6	NP- National program for public education in sustainable development
7	NP- National Program for Public Ecological Education
LoM-Mongolian Legal Laws	
1	LoM-The Constitution of Mongolia
2	LoM-Procedure to regulation following to the Mineral Laws

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3	LoM-Procedure to following regulation to the Amendment Law to the Minerals Law
4	LoM-The Minerals law of Mongolia
5	LoM- Law on payment for using Natural Resource /Revised/
6	LoM-Law on Environmental Impact Assessment /Revised/
7	LoM-Nature Environment Protection Law
8	LoM-Cadastral Mapping and Land Cadastre Law
9	LoM-Law on Concession
10	LoM-LAW ON ALLOCATION OF LAND TO MONGOLIAN CITIZENS FOR OWNERSHIP
11	LoM-Procedure to following regulation to the implementing LAW ON ALLOCATION OF LAND TO MONGOLIAN CITIZENS FOR OWNERSHIP
12	LoM-Law on Border
13	LoM-Laws of Mongolia on Land
14	LoM-Suboil Law
15	LoM-Law on Cropping
16	LoM-Law on Soil Protection and Prevention of Desertification
17	LoM- Law on Special Protected Area in the Buffer Zones
18	LoM-Law of Mongolia on Special Protected Area
19	LoM-Criminal Law
20	LoM- Laws on Common Minerals
PoM-Regulations and decrees of Ministries	
1	PoM-Resolution #106. Regulation on approval of state ecological policy
2	PoM-Resolution #35 for overturn theresolution to establish National Council for allocation of land
3	PoM-Resolution #78 on measures to implement the Law on Land
4	PoM-Resolution #28 on preparation of the implementation of the Law on Land
5	PoM-Resolution #96 on measures to implement Amendment Law to Subsoil Law
6	PoM-Resolution #18 on register some area into special protected area and renew boundary of some protected area
7	PoM-Resolution #04 on register some area into special protected area
8	PoM-Resolution #05 on register some area into special protected area
9	PoM-Resolution #06 on register some area into special protected area
10	PoM-Resolution #22 on register some area into special protected area
11	PoM-Resolution #26 on register some area into special protected area
12	PoM-Resolution #28 on register some area into special protected area
13	PoM-Resolution #29 on register some area into special protected area
14	PoM-Resolution #30 on register some area into special protected area
15	PoM-Resolution #38 on register some area into special protected area
16	PoM-Resolution #39 on register some area into special protected area
17	PoM-Resolution #43 on register some area into special protected area
18	PoM-Resolution #47 on register some area into special protected area
19	PoM-Resolution #56 on register some area into special protected area
20	PoM-Resolution #57 on register some area into special protected area
21	PoM-Resolution #83 on register some area into special protected area
22	LoM-Resolution #37 to measure to implementing Law on Allocation of land to Mongolian citizens for ownership
23	PoM-Laws on Allocation of areas of Mongolia to citizens-40
24	PoM-Resolution #81 on measure to implementing Law on Special Protected Area
25	PoM- Resolution #29 on approval The National Program on Special protected area
26	PoM-Resolution #26 on renew the classification of State protected area
27	PoM-Resolution #115 on change Khustai resevre into Khustain Nuruu National Park
28	PoM-Resolution #43 about to approve Green Development Policy
29	PoM-Resolution #74 on some regulations within approved Minerals Law
GoM-Governmental decrees and decisions	
1	GoM-Approval National Plan of Action to Combat Desertification #90

2	GoM-Define boundary in some nature reserves #67
3	GoM-Approval border in nature reserves and historical site #166
4	GoM-Resolution #87 on working land area for preservationist in Strictly Protected Area and National Parks
5	GoM-Approval of Plan #51. The first phase of The National Program on Special protected area between 1999-2005
6	GoM-Transfer some of the Government functions to the non-governmental organizations #49
7	GoM-Approval on National Programme On Persistent Organic Pollutants #99
8	GoM-about the boundaries of Special protected area #50
OoM-Order of Minister	
1	OoM-Procedure on plan and financing for review of land condition and quality inspection
2	OoM-Procedure for define category for desertification, drought and water resource management for it
3	OoM-Approval special procedure in Strictly Protected Area and National Parks
4	OoM-Temporary procedure for issue of land use and license in Special protected area
5	OoM-Procedure for tourism in special protected area
6	OoM-fee paid document for license issue of tourism activities in special protected area
7	OoM-Procedure for entrance fee into Special protected area and service payment in there
8	OoM-Establishing boundaries in near zone of special protected area
9	OoM-About zones near special protected area
10	OoM-About domestic boundaries special protected area
11	OoM-Administration division of special protected area
12	OoM-Administration division of special protected area
13	OoM-Procedure #218 for issue of land use and license in Special protected area
14	OoM-Procedure for forest activities in special protected area
15	OoM-Approval for define boundary of special protected area
16	OoM-Regulating structure of animal herd, send animals to culling and get research sample
17	OoM-Procedure for regulating number of wolves and hunting wild dogs in special protected area
18	OoM-Establishing boundary of some zone in special protected area
19	OoM-Procedure #21 for use spring water in special protected area
20	OoM- Procedure #36 for conducting research work in special protected area
21	OoM-Approval of renewing boundaries of special protected area
22	OoM-Ecology and economic assessment to estimate damages from action with changing land use purpose in special protected area #A-333
S-MNSStandard	
1	S-MNS 2305 : 1994 Soil. Order to accept, packing, transport, keeping
2	S-MNS 3297 : 1991 Soil. Soil sanitary estimation index norm of populated area
3	S-MNS 3298 : 1991 Soil. Common requirement putting of taking of test part
4	S-MNS 3473 : 1983 Environmental protection. Land use dissection. Terms and definitions
5	S-MNS 3985 : 1987 Protection of nature. Soil. Index type of sanitary position
6	S-MNS 5850 : 2008 Soil quality. Soil pollutants elements and substance
7	S-MNS 5851 : 2008 Symbol and uniform of Special Protected Areas. General requirements
8	S-MNS 5916 : 2008 Environment.Requirements for fertile soil removing and its temporary storage during the earth excavation
9	S-MNS ISO 11074-2:2001 Environment. Soil quality. Vocabulary. Part 2: Terms and definitions relating to sampling
10	S-MNS ISO 11074-1:2001 Environment. Soil quality.Vocabulary. Part 1: Terms and definitions relating to the protection and pollution of the soil
11	S-MNS 6147 : 2010 Environmental pollution, pollution control and protect – Maximum residue limit of pesticides in air and soil

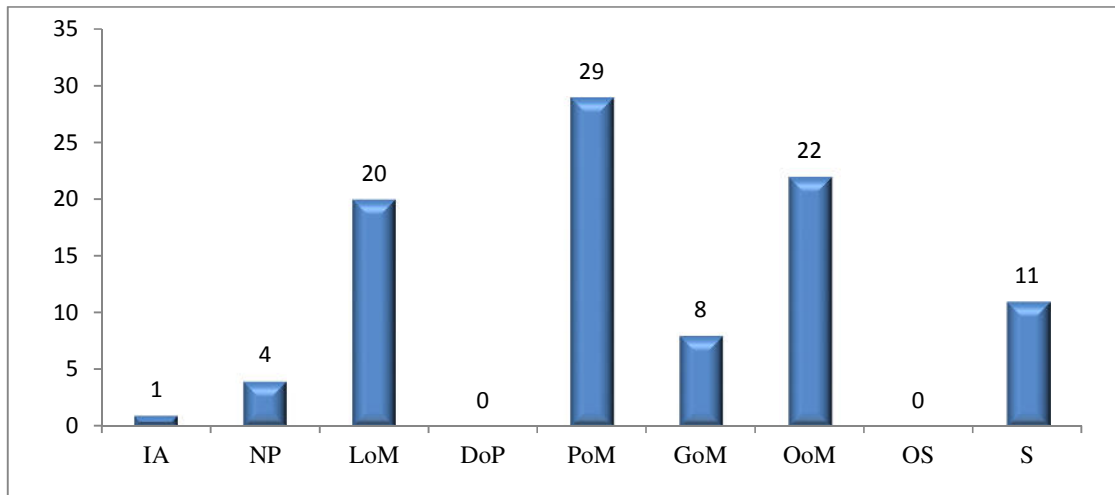


Figure iv: The number of laws and rules in Soil system and ground management

It is necessary to use the following legislation in improving biodiversity management and they should be used at the level of environmental department officer in charge of biological aspects.

V. Variosity of Biology

Table vi

Nº	Laws
IA-International Contract and convention	
1	IA-The Convention on Biological Diversity
2	IA-Cartagena Protocol on Biosafety to the Convention on Biological Diversity
3	IA-Convention on International Trade in Endangered Species of Wild Fauna and Flora
4	IA-Bonn Convention on the Conservation of Migratory Species of Wild Animals
5	IA-Convention on Wetlands of International Importance Especially as Waterfowl Habitat
6	IA-International Convention on the Regulation of Whaling
NP-National Program	
1	NP- National Program of Natural herbs
2	NP- National Program protect rare and endangered species
3	NP- National forest programme
4	NP-National Program of Red Deer
5	NP- State Ecological Policy
6	NP-National Security of Mongolia
7	NP- Comprehensive Development Strategy of Mongolia
8	NP- National program for public education in sustainable development
9	NP- National Program for Public Ecological Education
LoM-Mongolian Legal Laws	
1	LoM-The Constitution of Mongolia
2	LoM- Law on payment for using Natural Resource
3	LoM-Law on Environmental Impact Assessment
4	LoM-Nature Environment Protection Law
5	LoM-Law on Border
6	LoM-Endangered animals and plants based on the regulation of trade in the goods

7	LoM-Law on living modified organisms
8	LoM- Animal Law
9	LoM-Law on about Border prohibition and inspection of animal, plant and their raw materials
10	LoM-Law on Natural Plants
11	LoM-Forest Law
12	LoM-The Mongolian Law on Natural Plants
13	LoM-Criminal Law
14	LoM-Procedure to regulation following to the Mineral Laws
15	LoM-The Minerals law of Mongolia
16	LoM-Procedure to following regulation to the Amendment Law to the Minerals Law
17	LoM- Laws on Common Minerals
18	LoM-Law on Forest and Field Fire Prevention
PoM-Regulations and decrees of Ministries	
1	PoM-Resolution #106. Regulation on approval of state ecological policy
2	PoM-Resolution #107 on measures to be taken due to amendment to Law on Hunting
3	PoM-Resolution #45 on measures to be taken due to implementing Law on Forest and Field Fire Prevention
4	PoM-Resolution #24 on measures to be implementing with joining to International Convention
5	PoM-Resolution #31 on approval National Program of the red deer
6	PoM-Resolution #43 about to approve Green Development Policy
GoM-Governmental decrees and decisions	
1	GoM-Adoption of the list.Seeds and seedlings, animal germ, microorganisms in raw meat-173
2	GoM-Procedure #227. Forest Fund Agreement
3	GoM-Procedure #59, Forestry Incentives
4	GoM-Procedure #190. Plant Prohibition
5	GoM-About to determining the fee quoted Saker Falcon #171
6	GoM-Permission to renew concession agreement #156
7	GoM-Procedure #106 to estimate wildfire damages from forest and field fire
8	GoM-Determining number and name of hunting and trapping animals #263
9	GoM-Procedure for activity of hunting professional organization
10	GoM-Procedure #93 for activity of hunting professional organization. Appendix-1
11	GoM-Approval list of rare plants #145
12	GoM-Approval procedure and list of Rare animals #7
13	GoM-Procedure #105 to approve and renew forest inventory
14	GoM- Measures to implemeting of law on forest and field fire prevention #98
15	GoM- Establishing boundary of green zone around Capital city #326
16	GoM- Procedure #85 for forest inventory
17	GoM- About state general plan of forest management #362
18	GoM- Approval normative location of forest #255
19	GoM-Approvial plan on measures to implement of national program of red deer #88
20	GoM- For determining border gate of importing plant, seeds and plant protection substances annually. #146
21	GoM- Procedure #93 for issuing special permission for catching and hunting of rare animal. Appendix 2
22	GoM- Approval national program #30. Forest cleaning
23	GoM-Approval national program #277. To protect rare and very rare animals
24	GoM- Amendment to Forest program #113
25	GoM- About border port for accrossing living modified organisms #158
26	GoM- Animal ecology- economical assessment #248
OoM-Order of Minister	
1	OoM- Procedure for regulating number of wolves and hunting wild dogs in special protected area
2	OoM- For strengthening control on illegal hunting and usage of animal and prohibiting hunting and catching some animal - A-06

3	OoM- About prohibition on hunting and catching some animals # 411
4	OoM-To define category of forest fire burning #68
5	OoM- Act of damages during forest and field fire
6	OoM- Procedure #52 for organising hunting
7	OoM- Define duration and quotas for catching and hunting animal with special payment #88
8	OoM- About permission fee for catching and hunting animal and payment of using hunting resources
9	OoM- Catch and record animal for the purpose of science
10	OoM- Procedure #79 for issuing permission for hunting and catching animal
11	OoM- About to measures taken on protection of wild sheep -#362
12	OoM- Define maximum quotas limit for hunting animal in 2010 for the purpose of community and factory #407
13	OoM- Define maximum quotas limit for hunting animal in 2012 for the purpose of community and factory #A05
14	OoM- Certificate sample for catching and hunting animal for the purpose of community
15	OoM- Payment amount for using forest submission resources
16	OoM- For regulating maximum amount of using natural plant
17	OoM- Procedure #105 for organizing and conducting deer husbandry -105
18	OoM- Procedure #A-153 for controlling and issuing origin certificate
19	OoM- Procedure #173 for confirmation of origin reference blank
20	OoM- For amending procedure and renewing certificate sample #34
21	OoM- Procedure for conducting fishing business and contract example of fishing
22	OoM-Procedure for protect some rare animal, hunting and exporting some hunting goods
23	OoM- About protection of wild animals
24	OoM-The list of drug plant which grow in Mongolian territory
25	OoM- Procedure for test of plant protection substance, register list of plant protection substances in 1999-2000 and it's deleting
26	OoM- Procedure for preparing fuelwood from forest
27	OoM- Certificate example for preparing fuelwood from forest
28	OoM- To maintain and clear in forest
29	OoM- To confirm expenditure normative of some arrangements in forest husbandry
30	OoM- Procedure for using properly and protecting forest additional treasure
31	OoM- Procedure for working rule and requirement for forest professional organization
32	OoM- Procedure 1 for working rule and requirement for forest professional organization
33	OoM-Contract example for owning forest fund
34	OoM- Approval for confirming economical assessment of forest ecology #394
35	OoM- Procedure for hunting marmot and preparing leather #103
36	OoM-Procedure for implementing, financing and planning plant protection arrangement
37	OoM-Procedure and methodology for paying plant compensation
38	OoM-For prohibition of preparing birchwood
39	OoM-For prohibition in factory hunting of Mongolia antelope
40	OoM- For defining forest margin of dale zone
41	OoM- Ecology- economical assessment methodology of forest resource
42	OoM- Plant ecology-economical assessment #415
S-MNSStandard	
1	S-MNS 4118 : 1991Forestry. Terms and definitions
2	S-MNS 6191 : 2010General requirements for cultivating rare plants
3	S-MNS 3474 : 2003Plant protection. Terms and definition
4	S-MNS 3475 : 2003Plant quarantine. Terms and definitions

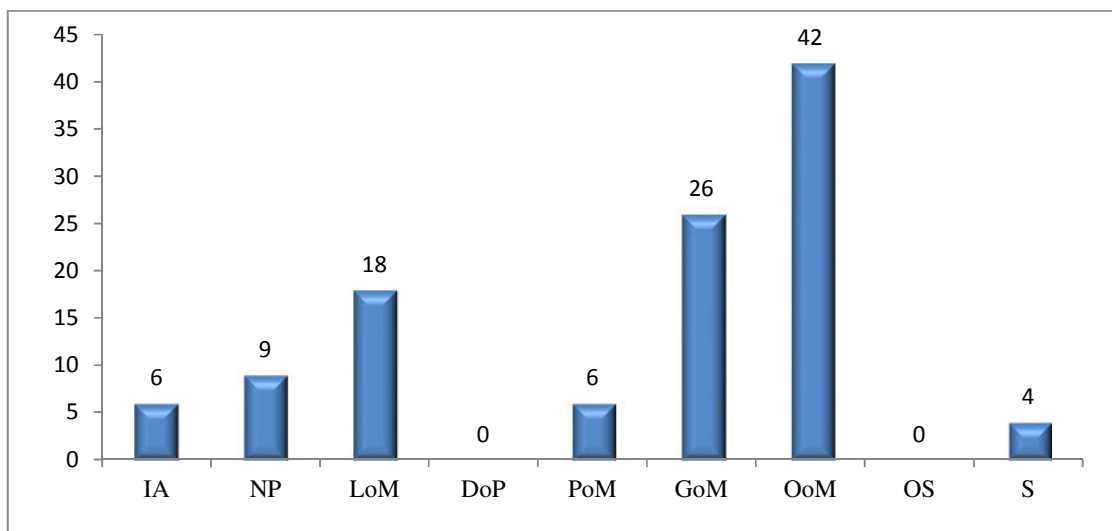


Figure v: The number of laws and rules in Variosity of Biology

It is necessary to use the following legislation in improving rehabilitation and mine closure management and they should be used at the level of environmental department officer in charge of rehabilitation issues.

VI. Rehabilitation and mine closing

Table vii

№	Laws
NP-National Program	
1	NP- State Ecological Policy
2	NP-National Security of Mongolia
3	NP- Comprehensive Development Strategy of Mongolia
4	NP- National program for public education in sustainable development
5	NP- National Program for Public Ecological Education
LoM-Mongolian Legal Laws	
1	LoM-The Constitution of Mongolia
2	LoM-Laws of Mongolia on Land
3	LoM-Suboil Law
4	LoM-Procedure to regulation following to the Mineral Laws
5	LoM-Procedure to following regulation to the Amendment Law to the Minerals Law
6	LoM-The Minerals law of Mongolia
7	LoM- Law on payment for using Natural Resource
8	LoM-Law on Environmental Impact Assessment
9	LoM-Nature Environment Protection Law
10	LoM-Law on Soil Protection and Prevention of Desertification
11	LoM-The Law on Petroleum. (with new revision)
12	LoM-Criminal Law
13	LoM- Law of Mongolia on Common Minerals
PoM-Regulations and decrees of Ministries	
•	PoM-Resolution #74 on some regulations within approved Minerals Law

•	PoM-Resolution #43 about to approve Green Development Policy
•	PoM-Resolution #106. Regulation on approval of State Ecological Policy
OoM-Order of Minister	
1	OoM-guideline for recovering and planting in damaged land during mineral exploration
2	OoM-Approve the methodology for biological and technical recovering in damaged land during mining #417
3	OoM-Methodology for estimating recovering assessment expenditure in damaged land during mining #418
4	OoM-Report on processing procedure for recovering during closing of mine
OS-Order of Suprevisor Agency	
1	OS-Procedure to close mine temporary and forever
S-MNSStandard	
1	S-MNS 5914 : 2008 Environment.Land reclamation. Terms and definitions
2	S-MNS 5915 : 2008 Environment. Classification of land destroyed due to mining activities
3	S-MNS 5917 : 2008 Environment.Reclamation of land destroyed due to mining activities. General technical requirements
4	S-MNS 5918 : 2008 Environment. Re-vegetation of destroyed land. General technical requirements
5	S-MNS 6200 : 2010 Reclamation of land destroyed due to petroleum exploration, production and development activities. General technical requirements
6	S-MNS 6296 : 2011 Closing of underground mine. Technical general requirement
7	S-MNS 6297 : 2011 Closing of industry for heap leaching and stacking of mineral. Technical general requirement
8	S-MNS 3472 : 1983 Agriculture. Terminology, vocabularies
9	S-MNS ASTM E 2278-2013 Guideline on use product from coal burning for recovering open pit mine.
10	S-MNS 0012-0-002 : 1987 Occupational safety standards system. Terms and definitions
11	S-MNS 5916 : 2008 Environment.Requirements for fertile soil removing and its temporary storage during the earth excavation

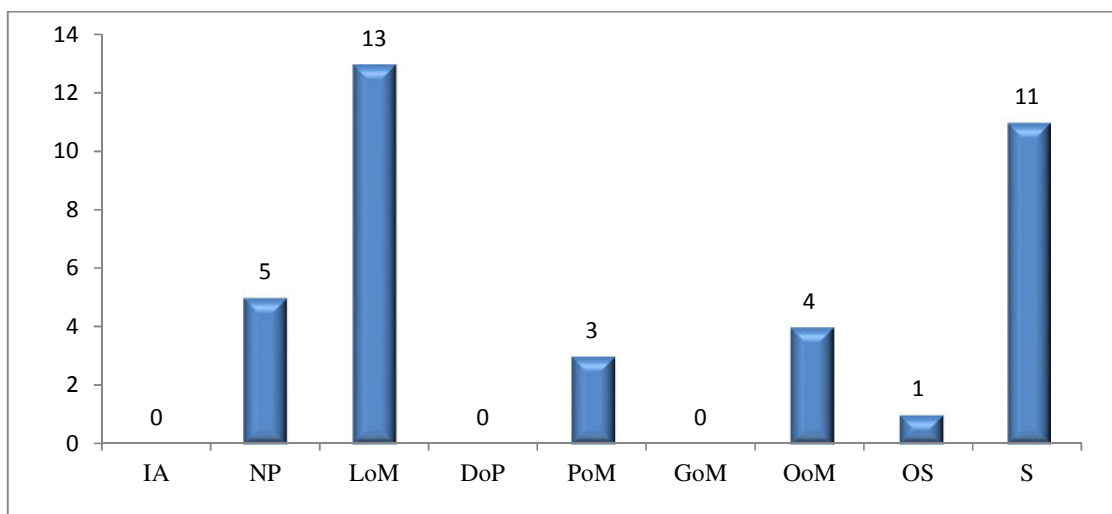


Figure vi: The number of laws and rules in reclamation and mine closing

It is necessary to use the following legislation in improving waste management and they should be used at the level of environmental department officer in charge of waste matters.

VII. Waste management*Table viii*

№	Laws
IA-International Contract and convention	
1	IA-The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
NP-National Program	
1	NP- State Ecological Policy
2	NP-National Security of Mongolia
3	NP- Comprehensive Development Strategy of Mongolia
4	NP- National program for public education in sustainable development
5	NP- National Program for Public Ecological Education
LoM-Mongolian Legal Laws	
1	LoM-The Constitution of Mongolia
2	LoM-Law on Environmental Impact Assessment
3	LoM-Nature Environment Protection Law
4	LoM-Law on Waste
5	LoM-Nuclear Energy Law
6	LoM-Criminal Law
7	LoM-Procedure to regulation following to the Mineral Laws
8	LoM-The Minerals law of Mongolia
9	LoM-Procedure to following regulation to the Amendment Law to the Minerals Law
10	LoM- Law on payment for using Natural Resource
11	LoM-Law on Border
12	LoM- Law of Mongolia on Common Minerals
13	LoM-Law on the Import, Export and Cross-border Transport of Hazardous Waste
DoP-Decree of the President	
1	DoP-About nuclear waste #184
PoM-Regulations and decrees of Ministries	
1	PoM-Resolution #43 about to approve Green Development Policy
2	PoM-Resolution #106. Regulation on approval of state ecological policy
GoM-Governmental decrees and decisions	
1	GoM-Approval methodology for payment and normative of waste #18
OoM-Order of Minister	
1	OoM-guideline for reporting, registering of saving and deleting hazardous waste #127
2	OoM-Type of centralized point for waste bury and requirements for it, waste bury
3	OoM-Procedure for collect waste database and informing
4	OoM-Procedure for report and register of national waste
5	OoM-Approval for category and classification of hazardous waste #324
S-MNSStandard	
1	S-MNS 5924 : 2008 Toilet and sewage pit. Technical requirements
2	S-MNS 5975 : 2009 Grease catcher equipment in waste water . General requirements
3	S-MNS 6230 : 2010. Define waste water point General requirement
4	S-MNS 6390 : 2013 Treated wastewater from wool and cashmere processing industries to centralized system. Technical requirements
5	S-MNS 5924 : 2008 Toilet and sewage pit. Technical requirements
6	S-MNS 5975 : 2009 Grease catcher equipment in waste water . General requirements
7	S-MNS 6230 : 2010. Define waste water point General requirement

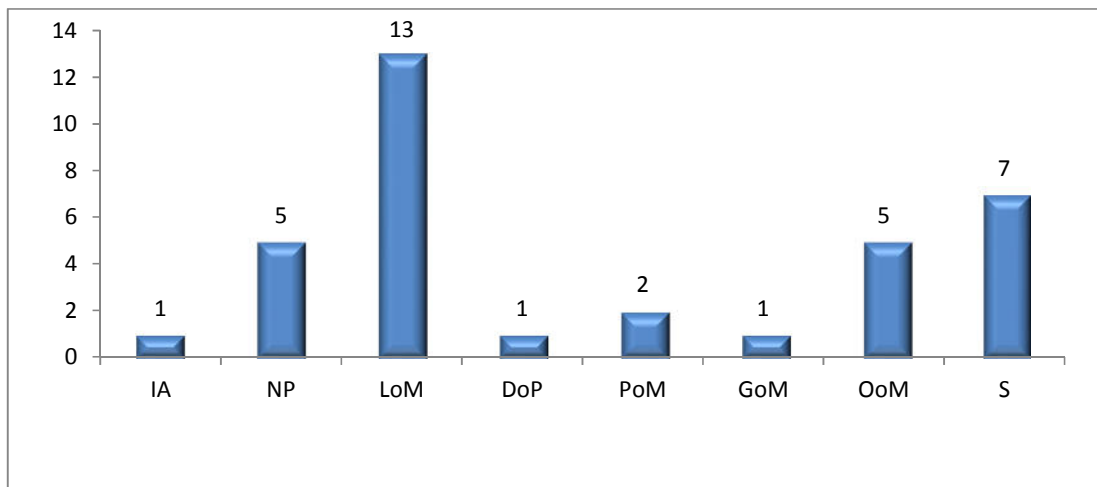


Figure vii: The number of laws and rules in waste management