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Environmental effects of mining from Qorveh city mines (Withemphasis onGalali Iron Ore)

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Abstract: *Range of operation from mines is getting more every day and certainly positive economic effects and negative environmental aspects of these activities increases. Kurdistan province and especially in Qorveh has giant minerals such as ornamental and building stones because of specific geographic and geologic condition. Mining operation in small scale, contour and open pit mining extract and other mining activities which environmental assessment rule doesn't include them caused a lot of negative effects in Qorveh. Large number of metallic and nonmetallic deposits, registered and in turn permits mines show inappropriate effects on environment. These reasons caused to search about environmental effects of mining activities in the study area. In this study, used methods like: chemical analysis of current water which affected by mining activities, composition of the metallic elements in soils around the mines, GPS, field studies, questionnaire and interview. Results indicate the heavy metals contamination in the water and soil sources around the metallic deposits, lack of contamination or minor contamination of heavy metals in soil sources around the non metallic deposits, high association of heavy toxic metals in textures of some plant species and distortion of agricultural lands and grasslands around the mines. Blasting in the mines caused, air contamination, voice contamination, cracking in lands and buildings of nearby villages. Increasing of road accidents and numerous economic-social effects are the addition outcomes of mines operation in study area. On the other hand, processing of ornamental stones and pumices shopping, because indirect environmental problems near the cities and villages in the study area.*
Key words*: contamination, environment, prospecting, Qorveh*

I. Introduction

Humans cannot live far apart of nature, this is the first principle of nature monitoring fans and they cannot live in nature without destruction, so it is unexpected from humans to save the nature. Like other creatures, human should create a difference in the environment, otherwise they cannot live but unlike the others, human should choose type and amounts of these changes (BAL, 2011).

Effects of both increasing population and per capita consumption of resources from 1880 to 1980 increased extraction of resources for 5 times and amounts of metals and minerals from 1930 till now are more than consumption of them in previous centuries (Haget, 1995).

Relationship and the same border between geomorphology and programming can be so exiting. Geomorphologists are able to exhibit search and recognize the ways of the morph and process of the earth surface. Such an information use to stopping the spreading no appropriate lands, decreasing negative effects of some activities and forecasting the politic and important planes effects (Hook, 1994).

Geomorphology major can be able to estimate engineering projects effects. in addition this scientific course have concentrate on other topics of environment (Konapfer et al., 2012).

Benedito et al., 2003 searched about environmental management of nonmetallic mines in Brazil and the role of small scale and nongovernmental operation in destroying the environment (Blodgett, 2004), environment effects of operation in New Mexico and its role in changing the quality of climate and groundwater.

Aigbedion, 2007 shows that the ecological disturbance, erosion, instability of soil and rocks comes from mining operation in Nigeria.My, 2009 searched about effects of wide extracting of mines in Quangnin province in Vietnam, and knew that these operations are effective in changing the coastal geomorphology, quality of current and ground water, and jungles. Saiadi et al, 2005

was searched about power and weak points of small scale operation and recognize that the most important weakness oe small scale operation is wide destroying and negative environmental effects.Malayeri et al., 2011 by sampling from soils around the Galali iron ore, shows that soils have deeply contamination by heavy metals, and for decreasing this contamination suggested to use the plants which store these elements in the area.

Qorveh is located in Sanandaj-Sirjan zone and has high mineral potential. Existence of numerous active and deactivate metallic and nonmetallic which are registered as a mine or not (table1) and effects on water, soil and

plant sources, destroying the scenes and change the application of agriculture lands, caused to search about outcomes and effects of mining by emphasizing at Galali iron ore.

Table1. Active, registered and turn permit mines in Qorveh

Mine type	Number of active mines	Number of registered or turn permit mines	Mine type	Number of registered or turn permit mines
pumice	122	16	Pocola	**4**
Ornamental rocks	26	41	Polymetal	**5**
Iron ore	1	5	Limestone and gyps	**3**
Clay soils	2	5	Thoophite Teraverthan kaolan	**4**
Gravel and sands of river floor	4	8	Silice fedspar	**5**
Gravel and sands of mountain	4	7	Gold Stibnite realgar	**3**
total	62	103		

Study area

Qorveh with 4600 Km^2 area is located in southeastern of Kurdistan province. The whole of study area is located in Sanandaj-Sirjan structural zone. Rock unit'sfeatures of sanandaj-sirjan, especially volcanism and metamorphism are different with Zagorsk orogeny, and have the same features with central Iran. Sanadaj-sirjan is the most active zone in Iran because of abundance magmatism and metamorphism.

Metamorphisms of Mesozoic- early Cenozoic which metamorphed by laramid orogeny, mostly located in the northwestern of sanandaj-sirjan, north Isfahan to sanandaj (aghanabati, 2005).

Galali iron ore is in 30 59 34 E longitude and 47 54 36 N latitude, 40 Km of Qorveh. This mine is located in protected heights of Badr and Parishan. Mining started from 1372 with 10 to 12 Mt reserve estimated. Main mineral is magnetite) Fe3o4with 59/26% Fe grade and in schist and sandstones operated by open pit mine way. Fig 1 shows the study area position and Galali iron ore in Badr and Parishan heights.

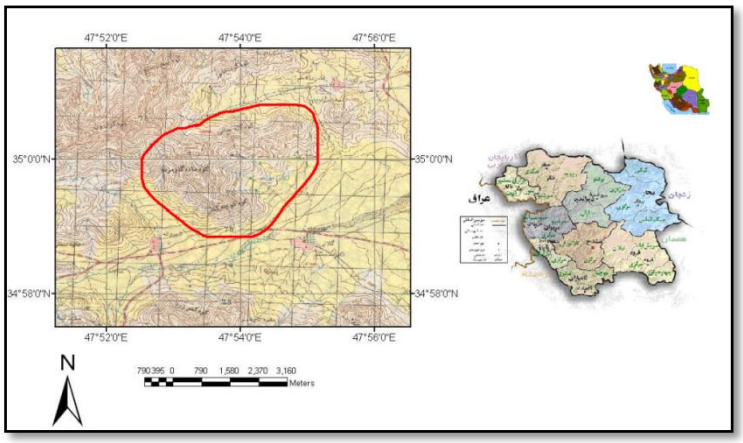

Fig 1 position of the study area.

II. Methodology

In order to doing the investigation samples of soil and water from the around of metallic and non metallic ores were collected for chemical analysis. Another data and information were gathered from organizations such as mine and industry, environment, natural resources and field observations from 17 active mines and 6 inactive mines by using the geological and topographic mines, satellite pictures and GPS. The steps of doing the study come in the fallow:

Step 1: detection the position of mines, samples position of soil, water and palnts by geologic and topographic maps, satellite pictures and GPS.

Step 2: sampling from water, soil and plant and doing different analysis in order to detection the present elements from mining.

Step 3: field observations and detection the distortion mining activities.

Step 4: interpretation of the gathered data from field observations and analysis by using the tables such as: 1- classification of drink water by Schoeler, 2- classification of drink water by Bogomolov, 3- classification of

water by Wilcox and American classification with the emphasis at salinity, 4- classification of water for human consumption and animal consumption by Kounine. Formulas like Sodium Adsorption Ratio and residual Sodium Carbonate (RSC) were used to investigation around the spring's water quality.
3 samples were collected from soils of around the Harsin marble mine (75 Km in the western of Galati iron ore) for detection the effects of nonmetallic ores on quality and composition of soil, and 2 samples were collected from observed area and take a mean from both of them and finally in order to achieving the results with high accuracy results from soil, water and plants analysis and field observations from metallic and nonmetallic mines were compared with each other.

III. Results

1- Soil

1-1-change the chemical composition of soils: entering dust, rubbish, drains which create by mining and blasting cause verifying the composition of soils and decrease the quality. The main source of heavy metal contamination of soils is industrial activities. Presenceof heavy metals in current contaminatedwater in high concentrations is toxic fir plants, animals and humans.Wide applications of polluted waters for agriculture is one of the reasons for association of metals in soil textures and cause soil contamination (Mardani, 2009). Agricultural lands in the Galali area drain by contaminated waters of springs which contaminated by mining activities. Malayeri et al., (2011) after sampling from the soils around Galali iron ore veins, detected that there is extremely contamination of heavy metals in these soils. According to the results in table 2, mean concentration of Arsenic, Cadmium, Iron, Nickel and Chromium in soil samples shows that concentration of these metals are more higher than the control area. Arsenic 1.49 times, Cadmium 3.2 times, Iron 95.58 times, Nickel 1.99 times and Chromium 1.2 times more than control area.

Table 2 analysis results of soils around the Galali mine and control area mg/kgDW (Malayeri et al., 2011).

Element	As	Cd	Cr	Fe	Ni
The total amount of metals in soils around mineral veins	34.832	17.408	151.754	46600.18	**215.784**
The total amount of soils in control area	23.362	5.423	126.127	487.500	**108.307**
The routine amount in nature	6	0.06	100	550	**40**

Unlike extremely effects of metallic mines extraction on chemical composition of soils, nonmetallic mines operation doesn't have more effects on adjacent lands soils. Table 3 show some results of soils analysis around the Harsin marble mines.

Table 3 composition of present elements in adjacent and control soils around the Horsing marble mines (ppm).

Sample number	Manganese (Mn)	Iron (Fe)	Zinc (Zn)	Copper (Cu)	Phosphor (P)	Potassium (K)	Organic Carbone (c.a)
1	15.2	4.37	1.22	1.90	10.8	630	**1.21**
2	8	2.64	0.44	1.70	10	520	**1.22**
3	21	4.95	0.8	1.90	10	640	**1.17**
Control sample	6.6	4.8	1.91	2.6	7	190	**0.48**

Comparing between analysis of samples from adjacent marble mines and control samples results show that there is not extremely and meaningful difference between them and differences are negligible.

1-2-the rocky agriculture lands: blasting and explosion activities in open pit mines causethrowing rocks into the adjacent lands and they become rocky. Rock throwing phenomenon is uncontrollable rock movement which created by explosion. Impressive factors in rock throwing because of blasting in open pit mining are: integration ore be jointed of rock, type of blasting materials, drilling and blasting patterns and geometric parameters (Shivaee et al., 2004). Blasting in the Galali iron ore caused throwing fine to coarse rocks to hundred meters far away and lands become rocky (fig 2. A). in agriculture lands territories around mine associated rocks which deposed by agricultures are visible, but each agricultural activity it can reduce. As it said, most of the mines in the study area are nonmetallic and ornamental; operation from ornamental rocks is in evolutions and open pit mine, mostly. association and fallowing the gangs which done by mining in evolutions and دامنه ها and transforming them in to the agricultural lands, with the help of gravity and current waters, cause that agricultural lands become rocky (Fig 2.d).

Fig2. A. lands become rocky by the blasting of metallic mines (Galali). b. wide distortion of agricultural lands (Baskul mine). C and d. extremely soil erosion in mining activities (inactive mines around Qorveh).

1-3-destroying of agricultural and lands: distortion of land comes fallow the small scale mining. In the study area most of metallic and nonmetallic mines are small scale. This factor in addition to another factors like lack of accurate primary studies, lack of enough, abuse of some owners, finding no pure veins, high values of materials and surface sediments, low ore reservoir, inappropriate topography, and creating long roads are the main reasons of agricultural lands destroying (fig 2 b). High values of gangs from unsuccessful exploration can be found in evolutions around active and inactive mines. Oraei et al., (2004) know that extraction of ornamental rocks usually done by noneconomic ways. It means that extraction in such mines done without any scientific programming and fallows this factors waste of mineral materials decreases. In order to estimating the amount of deformation and distortion of agricultural lands 3 active, almost active and inactive mines choose randomly by GPS and 89 hectares estimated (fig 3).

Fig 3.Distortion of agricultural lands by mining.

2-Water: Operation of mines in study area in condition during recently years, create contamination in water sources.

1-2-Drainages: drainages from mine operation are the most dangerous ones which cause environmental contamination. Factors such as geology, mineralogy, hydrology and climate effects can affect the extreme and time of drainage creation. Drainages in nonmetallic and ornamental mines is not as negative as metallic mines and in the study area because of contour operation of nonmetallic ores-expect Baba shourab ghasalan marble and Rudkhane marble mines which are open pit- drainages didn't detect. Of course because of mineral type drainages are not so dangereouse (fig 4. b). But creation of such basins can be dangerous if drainages be there for a long time and change to the acidic basins. In Galali iron ore, many big and small basins were created by mining activities. In warm seasons because of low Debi of springs and inner peat slip, water won't come out of the basins but during rainy weather and with the help of topography slip of valley, water of these basins move toward the dwon side of the valley and across the agricultural lands and into the rivers. If birds and animals drink this water they would be (fig 4 a).

Fig4. A. creation of drainage basin in Galali irons mine. b. association of drainage in Babashouran marble.

Water contamination: operation of in addition to creation of drainage basins, causes verifying in chemical composition of current water. Table 4 shows the results of spring's water around Galali iron mine (fig 1) analysis.

Table 4: chemical composition of spring's number 1 and 2.

Location	Electronic conductivity EC*10	Residual TDSMg/l	pH	Co_3	HCO_3	Cl	SO_4	Ca	Mg	Na
Spring number 1	853	554	7.8	0	2.2	0.3	0.18	6.5	1.6	**0.32**
Spring number 2	297	187	8.21	0	2.4	0.3	5.9	2	0.7	**0.2**

*spring number 1 is located near the mine and number 2 is located far from the mine.

Resolution of the results from chemical analysis of springs water around the Gaqlali iron ore as the fallow:

1- The water of spring number 1: according to American water classification (irrigation) according to salinity, is in third group (high salinity degree. Electronic conductivity between 750 to 2250 micro mohs/Cm).Spring number 2 is in in group near the mean.

$$S.A.R = \frac{Na}{\frac{\sqrt{ca+mg}}{2}}$$

2- By calculation of "sodium absorption ratio" according to and "residual carbonate sodium" according to RSC= (CO3+HCO3)-(CA+Mg) for spring 1, 0.15 and -5.7 and for spring 2, 0.14 and -0.3 were calculated. Therefore using the both springs for irrigation of plants and agricultural productions doesn't have any problem yet. 3- By using will-cox table which (s) is the symbol of S.A.R. and C is the symbol of electronic conductivity E.C in the water. Water of spring 1 is in group S1 C3 and utilizable just when soil is lightweight texture and have high permeability for water. 4- According to tables which used to classifying the quality of water for drinking and human usages by Shuler, Bogomolof ang Kunin, spring 1 is not appropriate for drinking. While the villagers witness that the water was provide the drink water. 5- According to koninis table spring 1 is not appropriate even for animals.

3- plants: verifying in chemical composition and presence elements ofsoil and water causes concentration and reserve this element in plants textures near the mine;otherwise most of the times use these plants for a long time cause to poisoning. In table 5 there is the results metallic elements analysis in the roots and upper parts of some species plants around the Galali iron mine. note that high concentration of iron is invisible in roots and upper parts of the plants.

Table 2, results of heavy metal analysis in roots and upper parts of some species plants around the Galali iron mine.Mg/kg/Dw (Malayeri et al., 2011).

Species name	plant components	As	Cd	Fe	Ni	Cr
Centuria iberica	root	31.68	10.49	93266.00	85.18	**72.66**
	Upper parts	19.38	9.87	35722.80	34.63	**20.47**
Stipa barbata	root	44.25	54.76	24428.00	105.37	**416.52**
	Upper parts	10.16	9.28	23379.50	23.14	**10.92**
Salvia spiuosa	root	29.11	11.15	57375.10	176.15	**70.27**
	Upper parts	39.35	11.21	13460.22	241.84	**166.51**

4- Blasting in mines and their outcomes:
Blasting is one of the most important process for open pit mining extraction which sometimes causes inappropriate outcomes like throwing rocks, shaking the land, exploding shaking the air, extremely breaking or scurry back of the lands, noising and dust creation (Shiaee et al., 2004). In nonmetallic mines there isn't any blasting, but in metallic ones blasting is one of the main steps for exploration and extraction.
Some blasting outcomes are:

4- a: shaking the land: the cost in time period, material and structure of the rock and distance from the center of exploding- in the greater distances the vibration amplitude will be decreases but vibration time will be increases- are the most parameters in blasting (Shivaee et al., 2004). Blasting and exploding in mine cause wide cracks and damage the houses in villages near the Galali iron ore (fig 5. a). And foeced governments to pay the compensation. It seems that the low interval between village and exploding center and low quality of houses are the main reasons of damaging the buildings.

4 b. creation cracks in the lands near the mine: crossing the waves from exploding cause's extension and compaction shears in rock mass and stimulate the mechanic and dynamic behaviors in rocks (Hosseini et al., 2004). Exploding degree and rock's reaction against them cause creating or becoming big the cracks, with hundred meters long and 7-10 Cm width. Agricultures didn't detect any crack before mining activities. Villagers believe that explodes cause decreasing the spring's water.

4 c. dust creation: dust creation is one if the open pit mining outcomes. This phenomenon is visible in all exploration and extraction especially in blasting. This factor is so harmful for human healthy. In addition to harmful effedt on human healthy, dust interrupt the photosynthesis and causes contamination (fig 5 b).

Fig 5 a- destroying the buildings in Galali village.B. dust of mining which created by blasting (cucumber plant 400metere near the Galali iron ore).

5- Indirect effects of mine operation: potential of Qorveh for extraction of ornamental rocks caused creating shopping centers around Qorveh. Presence of shopping centers has negative effects on environment.

6-Stonemasonries and their environmental effects: stonemasonries in the study area are mostly in two towns and in the city. Rocks for these units provide from surrounded mines. In recently years, because of production variety tile types, entering Chinese stones and becoming expensive of materials some production units became inactive. Some stonemasonries have one cutting set and another have two.

Stonemasonries with one cutting set product 400 tons of waste in the year, this quantity in Stonemasonries with two cutting set is 600 tones in a year. The average of total entered rock blocks in factories change to gange and exited from them (Mosaferi et al., 2007), therefore total produced wastes estimated 14000 tones which is 25% lesser than total produced gangs by factories. The 755% residual deposited near stonemasonries (fig 6 b) or by buying agricultural land deposited there (fig 6. A) sometimesthis gangs deposited along no crowd roads, rivers (fig 6. C) valleys, slips or near agricultural land illegally (fig6. D). most of agricultural lands destroyed,because of locating stonemasonries and gang deposited on them.

Fig 6 a. gangs discharging in agricultural lands. B. association of gangs near sronmasonaries.C. illegal deposition near river.D. illegal deposition along roads and agricultural lands.

The combine of water and stone powder from stonemasonries in contact with atmosphere, because of its moisture getting hard at first and by entering in agriculture lands cause rocky lands and go in soil composition during plowing.

This hard powder after sometimes lose its hardness and disperse in the atmosphere as silica.among dust grains which produced in in industrial process and defuse, silica is one of the most important grains, this contamination grain is one the most dangerous in aorcontaminations and it is Silicosis illness factor (Ahmadi, 2004).

Recycling the gangs of ornamental rocks is one of the problems which scientists, environment fans and mine engineers want to solve it but today technology most of recycles are not economic, for example 100 tones gang with alominosilicate composition gives 8 tones aluminum, 5 tons iron, 500 Kg titan, 32 Kg chromium, 15 Kg Vanadium, 3 Kg Copper, 1.8 Kg Lead (Kozhorat, 1995).

2-5- Pumice shopping centers: increase the pumice shopping centers is one of the other outcomes of mining operation in the study area. Pumice is the result of direct volcanism activities and has a lot of applications because of its light weight in buildings, block making and others. Shopping centers are mostly near the mines, because pumice concentration is in Ghezelche kond and Ahmad abad bash villages and lack of direct buying for consumers. Environment engineers believe that these centers must work in safe place but more than 90% of them don't have these features.

1-2-5 Voice and air contamination: hearing load voice and noises causes reducing the hearing power and psychological, physiologic and heart illnesses (khaledi, 2005). Activity of many heavy cars and trucks in the same time which some of them are charge and some other discharge the pumice creates too much noise. Charging and Discharging the trucks of pumice from open pit mines, light weight of pumices and fine grains can move in air with even a braaz better sell of fine grains, lack of appropriate roads are the reasons of contamination near the pumice shopping centers.

5-2-2. keeping transformation slow and road accidents: there is a relationship between mines and accident satisfactions in Haraz road. There is a relation between protection and rock fallows which come down by truck movements and accidents (Ahadi, 2010).

Use old trucks for pumices transformation to shopping centers, inappropriate roads, numerous trucks in the road which transfer ornamental rocks, lack of protection on pumices in the trucks, in addition to creation traffic and voice contamination in cities, cause increasing road accidents. With view on pumices satisfactions, numbers of shopping centers can guess the high traffic of trucks in the road. Low speed of trucks causes subsequent traffics and road accidents. Important and effective factor in accidents event is , lack of protection and cover on trucks. In uphill, downhill, winding, puddle and during windy weather pumices throw down from the trucks and cause breaking glass or color disappear of cars in the road. Then cars force to illegal overtaking and accident or suddenly brake and cause chain accidents

IV. Results:

1- Operation from mines especially metallic mines, causes soil and water contamination in the study area.

2- Operation of mines especially nonmetallic mines causes distortion, deformation and extremely erosion of agricultural lands in the study area.

3- Against extreme effects of metallic mines on soil and water contamination, nonmetallic mines don't affect water and soil resources. But they cause deformation lands and geomorphology.

4- Heavy metals in water and soil around mines concentrate in plant textures and by ……. Species like Centurea iberica, Stipa barbata,Salvin spinosa, concentration of heavy metals can decrease.
6- most of mining activities in the study area , are small scale and open pit mining and contour operation and almost for most of them there isn't any environmental estimating, so effects and outcomes of them are much high.
7- environmental effects of mining in the study area not only are directly from exploration and operation but also ornamental rocks processing in stonemasonries and pumices shopping centers are affective.
8-water and soil contamination, verifying agricultural lands application in the area cause harmful economic and social problems subsequently.

V. Discussion and conclusion:

Mining provide necessary materials for living and progressing but on the other hand by increasing contamination don't allow human for use the healthy environment. This is an important reason that many countries search about environmental effects of mining (saiareh et al., 2007). Environmental effect is the main problem of small scale mining (Saiadi et al., 2007). Because of small scale operation on mines in study area, extraction outcomes affect on environment directly or indirectly. Researches show that consumption of Arsenic contaminated water cause some epidemic illnesses in north Qorveh and Bijar (saiareh et al., 2007). With this condition of drink water some parts of the city is contaminated and incorrect mine operation is the reason for contaminating another parts.

Villages economic is related to water and soil resources. Quantity and quality changes because decreasing the villagers income. Buying mines adjacent lands, renting or selling them for pumice shopping center or gange deposition and other factors cause encouraging the villagers to immigration, increasing peoples without job, house problems, harmful jobs creation and other social problems. Statistics of mine owners or renters show negative effects on villagers. While others have good incomes. Comparing between environmental effects, resource distortion and number of people who done this work indicate that number of people with this job is low.

Badr and Parishan evolutions with 37000 areas in 2006 known as protected regions. In this region 42 bird types, 8 types ofcreeping and 3 types of fishes were known till now, potential of this area is more than these statistics (Kurdistan protected regions glassolary, 2008). Galali iron ore is located in northeastern of Badr and Parishan evolutions. This mine was started in 1993, 2006 Badr and Parishan knew as protedted regions and after mining strated, it had the permission for activity and operation in protected area. Water contamination, acidic basins and blasting have dangerous effects on alive species in protected area.

References:

[1]. Ahmadi et al, Hassan (2004), Tehran air condition and concentration of dust in stonemasonries in Hamedan province, medicine faculty, 4th professional protection in Iran, Hamedan, 231-236
[2]. Ahadi et al., Mohammadreza (2010), research the vehicles role in road accidents, Haraz road, traffic management researches, 17, 53-57.
[3]. Oraee et al, Kazem. (2004). Production programming in ornamental rocka mines, mine engineering conference, Iran, 12 pages.
[4]. Kurdistan protected regions glassolary, (2008), environment protection of Kurdistan, 22 pages.
[5]. Aghanabati, Ali. (2011), geology and mineral potential of Kurdistan province, geology education growing. 69, Tehran, 8-17.
[6]. Baal et al., Trans, 2011, ideologies and dreams, translated by Ahmad sabourikashani, Amme book publication, first publication, Tehran, 668 pages.
[7]. Hosseni et al., Hadi, (2003), research and calculate of mine exploding energy transformation, Songun Cu mine, mine engineering conference, Iran, Tehran, 11 pages.
[8]. Khaledi, Shahriar, (2004), human geography (cultural view), azad university publication, first publication, Tehran 236 pages.
[9]. Environmental effects of exploration activities guide, (2008), mining engineering organization publication, first publication, mine and industry ministry, 38 pages.
[10]. Saiareh et al., Alireza, (2007), geological and environmental researches in Qorveh and Bijar, primary report, geology and mine exploration organization.
[11]. Shivaee et al., Alireza,(2004), research about earth vibration and rock throwing in exploding activities, a case study on She chahun iron ore, mine engineering conference, Tehran, 12 pages.
[12]. Saiadi et al., Ahmadreza, (2005), small scale mining, 4th mining engineering conference, 11 pages.
[13]. Kuzhvarth, beblush, (1995), nonmetallic minerals application in environmental geology and agriculture, translated by Mohammad Yazdi, jungle and grassland, 26, Tehran , 33-37.
[14]. Konapfer et al., Peter, L.K, (2010), public geomorphology, translated by SiavashShayan, geography education growing, volume 25, 1, Tehran, 26-33.
[15]. mosaferi et al., Mohammad, (2006), solid environmental wastes management of stonemasonries in Qom provience, environmental science and technology, 33- Tehran.
[16]. Mardani et al., Gashtasb, (2009), resaech on contaminated soil in South of Tehran near surface water which contaminated by heavy metals, water and waste, Tehran, 3, 108-113.
[17]. Malapert et al,Beerhouse, (2010), introduce some deposition species in heavy metal contaminated region, a case study in Galati iron ore, first GIAH PALAEE conference, Kerman, 5 pages.
[18]. Hook, G. M., (1993), geomorphology in environmental programming, translated by Mohammad jafar Zomarrodian, sat publication, first publication, Tehran, 295 pages.

[19]. Haget, Peter, (2005), new compositional geography, translated by ShapourGoudarzi pour, Samt publication, first volume, second publication, Tehran, 42 pages.
[20]. Aigbedion, I and Iyayi, S. E, (2007), Environmental effect of mineral exploitation in Nigeria, International Journal of Physical Sciences Vol. 2 (2), pp. 033-038.
[21]. ArleiBeneditoMacedo∗, De´cio Jose´ de Almeida Mello Freire, He´rcio Akimoto,(2003), Environmental management in the Brazilian non-metallic small-scale mining sector, Journal of Cleaner Production 11 ,pp. 197–206
[22]. Steve Blodgett, M.S,(2004), Environmental Impacts of Aggregate and Stone Mining New Mexico Case Study, Center for Science in Public Participation
[23]. Vo Chi MY and M. Pham Viet HOA, (2009),The Effect of Mining Exploit for Environment in QuangNinh Province ,Vietnam, - Mapping, Aerial Survey and Remote Sensing I,1-7.