Mining Phenomenon of Agate Gemstone to Change of Environment, Social and Economic at Southeast Sulawesi Province

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Abstract: This research aim to analyse agate games tone potency in various region of South-East Sulawesi Province and change of environmental and social-economic and resulted by mining of agate gemstone. This research was conducted in four region of South-East Sulawesi Province, that is: North Buton, Bombana, South Konawe, and North Konawe. Data was collected through of various seconder data, result of research which is relevant this mater, field observation and interview with key informant. Data was analyzed with qualitative method and description of cause and effect between mining phenomenon. Result of research indicate that agate gemstone potency in South-East Sulawesi Province is over spread. The region have unique gemstone, various of color and pattern, which is on its base formed by focil wood is krisokola, pursuant to its hardness of apatite classification and ortoklas, type of weighing mineral is under diamond. Color is influenced by content of nickel, pirit, gold, iron and copper. Income of society to be increasing followed by alternative living. Changing of society perception about agate gemstone from mystical to accessories value and prestige its owner. Mining of gemstone resulting land conversion, opening of forest and decreasing of the water source for agriculture and other activity. So that need the adjacent, regulation of government and supported by research of geophysics, geology and geography and also capable mining technique to realize sustainable environment.

Key-Words: mining, gemstone, agate, environment change, social, economic
1 Introduction
Indonesia has natural resources which amaze. Located in Ring Fire of”, Indonesia islands become the source of various valuable mineral. Gemstones become valuable mineral able to be found. Gemstone = Stone Jewel = valuable stone. Each; Every rock stone type, mineral , and other natural raw material which after processed or processed to have the beauty and adequate resilience to be wearied as ornament goods [1,11,13]. Unequal gemstone of stone with Precious (gemstone jewel stone) like emerald delima-safir intan-mirah. It is of course gemstone in Indonesia not yet all data, even though to Indonesia not yet been mapped of gemstone on world. Though a lot of gemstone in Indonesia have special and good quality.

2. Problem Formulation
Location of this research in four region of South-East Sulawesi province, that is: North Buton, Bombana, South Konawe, and North Konawe. Data was collected through of various sekunder data, result of research which is relevant this mater, field observation and interview with key informan. Data analysed with qualitative method and description of cause and effect between mining phenomenons.

3. Problem Solution
3.1 Potency of Agate Gemstone in South-East Sulawesi Province
Gemstone which identified in South-East Sulawesi spread over in region, that is: North Buton, Bombana, South Konawe, and North Konawe. The type, hardness, colour and quality are variously and each owning the special character.

Agate gemstone from North Buton has variously typical. Not merely its motif facet, but also obstetrical facet, agate gemstone of North Buton containing many pirit ( iron mineral mixture and brimstone) so that price sell him bounce up. Agate gemstone many get it in the mountain and river. Agate type of silver badar found in Ereke-North Buton. Type and density of agate gemstone rate 6-8 scale of most, coming near strength of diamond (10). Besides agate gemstone, found other specification also from wood fossil of krisokola identified from ebony which old age 65 million year. Because metamorphosis that happened have at full so that light can penetrate.

Result of form identify and color, that wood fossil represent or ebony[15].

One of the agate gemstone enthused by consumer is agate gemstone from Kabaena-Bombana, among others type of Giok, Turquoise, Diesel fuel and Moss. The range Price from Rp.300.000,- till tens of million after sharpened by worker. Agate gemstone which not yet been sharpened, its price reach
Rp.500,000,- till Rp. 5 million per kg depend on gemstone type.

Gemstone in Bombana area, precisely in Pongkalaero and Batuawu-Kabaena area formed at final phase a coagulation of magma which in *basalt* character, happened because process refrigeration of magma which sudden so that the no time crystallizing (crystallization) yield amorf tekstur. Mains of rock generally represent rock from substratum great chalk era. Gemstone color depends on mains rock as its pollutant. Mains rock which is composing of *serpentinit*, *gabro* or *dunit* will yield green chromatic stone until brass colour. Mains rock which is composing of iron will yield yellow until brown, if composing of nickel will yield grey-purple [1,11,13]. Most location gemstone in Pongkalaero and Batuawu area. Pangkalaero can be reached by using boat (*katinting*) fringe the coast to south about 45 minute, continued by walking trace of Wawua river up at river pate about 4 km. That location has many deposited of gemstone. Location of Batuawu also can be reached to use boat with distance about 45 minute, fringe coast to north, continued walked about 1.5 km fringe the dry river / path wild. Location of Gemstone area is Region Contract of PT. INCO. The Location is generally growed by bush forest vegetation.

The Gemstone in Bombana has verities color, for example green, yellow, black, white, sorrel, purple, amorf.

Fraction of gemstone generally *konkoidal*, often get it cavity contain of quartz crystallite, gleam glass peel, most is compact. The gemstone naturally there are as "rock bed" at dry river or path wild. Partly of gemstone there are in the hill which is closed by soil.

### 3.2 Gemstone exploitation in South-East Sulawesi Province

Intake of local people version is general conducted by paring the cover of land or ground by using simple appliance, more than cover of vegetation is bush forest.
Because its pattern (mode of occurrence) gemstone resource is spread over so it cannot use formula calculation of standard reserve (thick, estimation percentage, and mean area).

### 3.3 Change of environmental condition, social and economic

Damage of environment possible happened because agate most there are in the land or ground so the worker cope to unload top soil until deepness 20 m. More than anything else if crowded market progressively and more its enthusiast, hence very open possibility of environment damage. The crisis which result is quality of environment to be decreasing. Besides that, the land of agriculture its around mining of agate also will annoyed. It is not impossible the agriculture change function if people think more beneficial become mineworker of agate compared to become farmer. Erosion and sedimentation which is flange to river of course to increase and the happening of mineworker conflict because struggling of land. Phenomenon of agate gemstone will be positive impact in some cases.

At least to this creative economics give advantage because the people economics can make a move up at which are positive. The making of agate assigning have glowed at many area to become centers of value economics. The people economic and tourism industry become to expand.

| Price of raw material: Rp. 1.000 bh/ kg | Traditional (40 bh/kg): Rp. 40.000,- | machine standard (150 bh/ kg): Rp. 150.000,- (the price depend on quality and design product). The workers get added value more than income is Rp. 40. |

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**Picture 7. Mining of Gemstone by People**

**Picture 8. Worker of Agate Gemstone**

**Picture 9. Agate Gemstone from South-East Sulawesi**
Tables 1. Phenomenon Mining of Agate Gemstone To Change of Environment Social, and Economic

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Agate phenomenon has change the way of people about agate. Before that, agate gemstone have magical and mystical value which trusted by people can improve portion, couple, health, luck and others. But now, the agate gemstone to become esthetics value, fashion, and prestige for people in South-East Sulawesi (including servant public and high functionary).

3.4 The Mining Solution of Agate Gemstone to Sustainable environment

Besides economic benefit along the increasing of people enthusiasm to agate gemstone, people require to give information about impact effect of mass dig. More than anything the natural gemstone represent natural resource which is not deflect to be renewed [4,9,10].

Mining activity by people often did not consider of safety and disregard impact to environment. Though dig of rock at certain deepness of diffraction influence to land or ground contour. As a result, the land or ground easy downhill of soil when rain or if happened earthquake [2, 3, 4, 5, 6, 7].

The Dig leaves over holes because farm left off hand. Inexistence process cure of farm of pasca mine that menace preservation natural and safety of people citizen. Dig with certain pattern in land or ground make gristle area slide to extend. The worker must be dig in deepness 16-20 meter to get 3kg natural rock [12, 14, 16]. Though, the people often collect natural rock tens of kg to be sold. During the time there is no required time depth study till potency slide diffraction happened. For that need there is research in area mine to know strength of natural rock in sustaining land or ground. If exploited is abundant, particularly vulnerable happened to erosive.

4 Conclusion

- Agate gemstone potency with various of color, type, and quality very copious in South-East Sulawesi region, with mining of people use simple appliance
- Prospect interposing of processing of agate gemstone can improve earnings of people, creative economic, and earnings of local government
- Assess information people to agate gemstone shift up its owner prestige and esthetics
- Exploiting effort and mining of natural rock require to be supported by law and national considering saving of environment and without disregarding importance of people, economics and social.

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