ASSET TRANSFER FUNCTION EFFECT OF AGRICULTURAL LAND TO ILLEGAL MINING

by . Junaidi

Submission date: 06-Oct-2020 09:47PM (UTC+0700)
Submission ID: 1407026907
File name: AND_TO_ILLEGAL_MINING_AND_IMPACT_ON_BIODIVERSITY_RIVER_ASSET.doc (11.76M)
Word count: 4682
Character count: 23811

ASSET TRANSFER FUNCTION EFFECT OF AGRICULTURAL LAND TO ILLEGAL MINING AND IMPACT ON BIODIVERSITY RIVER ASSET, AND INCOME IN THE DISTRICT SIJUNJUNG, WEST SUMATRA, INDONESIA.

By:
Junaidi
Fisheries and Marine Sciences
Bung Hatta University

Abstract

Effect of conversion of agricultural assets against illegal mining and its impact on the biodiversity of the river, as well as income in Sijunjung district, West Sumatra, Indonesia. The purpose of this study was to analyze the effect of conversion of agricultural assets against illegal mining and its impact on environmental pollution, biodiversity and people's income stream in Sijunjung district, West Sumatra, Indonesia. There has been a decline in assets by 1027 hectares of paddy fields in the illegal gold mining area since 2007 (4039 ha) to 3012 ha in 2013. This research is very important to do this has brought a bad influence on the environment and pollution of the river by heavy metals biodiversity Mercuri has exceeded a threshold that is 0,01035mg / L. The use of machines to large magnitude (40 PK) cause noise and air pollution due to exhaust gas CO and CO2, and the silting of the river due to dredging and dumping sand into the watershed. Sampling was done at three locations in the river Kuantan namely: upstream, midstream, and downstream to water quality and fish species, as well as revenue. The results show that there has been water pollution by metals Cu, Zn, Pb and Hg in the upstream, midstream and downstream of each $0{,}572^{1} \pm 1.223$, $0.659 \pm 0{,}016^{1}$, $0{,}008^{1} \pm 0.926$ and $0.108 \pm 0{,}002^{1}$, $0{,}016^{2} \pm 1.086$, $0.361 \pm 0{,}043^{2}$, $0{,}014^{2} \pm 0.485$ and $0.092 \pm 0{,}014^{2}$, $0{,}052^{3} \pm 0.803$, 0.503 ± 0.136^{3}, $0{,}061^{3} \pm 0.591$ and $0.022 \pm 0{,}003^{3}$, where $P < 0.05$ The result of this contamination, the decline in fish populations asset of ± 50%, from the illegal mining increased the average income of Rp owners. 1,500,000 - Rp. 9,000,000 / Sunday, and financiers of Rp. 1,500,000 - 18,000,000 / Sunday, and workers Rp. 1,500,000 - Rp. 3,000,000 / Sunday.

Keywords: The transformation of agricultural land assets to Illegal mining, water pollution, decreasing fish, and income

1. Background of Study

Gold mining without a permit (Container) has brought changes to the environment, particularly the aquatic environment of the river. This change is due to the conversion of agricultural land assets to gold mining in the river basin that has Batang Kuantan to other small rivers. The contamination caused by mining that degrade water quality, this is due to the mining of certain heavy metals in search of gold.

Kaplan and Newbold, 1993 suggests that the contribution of organic matter to energy supplies reach 30-75% of the public waters (rivers, reservoirs, lakes, swamps, flood) as a source of energy and nutrient cycle as a component of metabolism in the waters. As a result of these changes happen to mine the nutrients are in the waters. If organic material is disturbed the balance will affect biodiversity, marine productivity and fish production (Braioni et al, 2001).

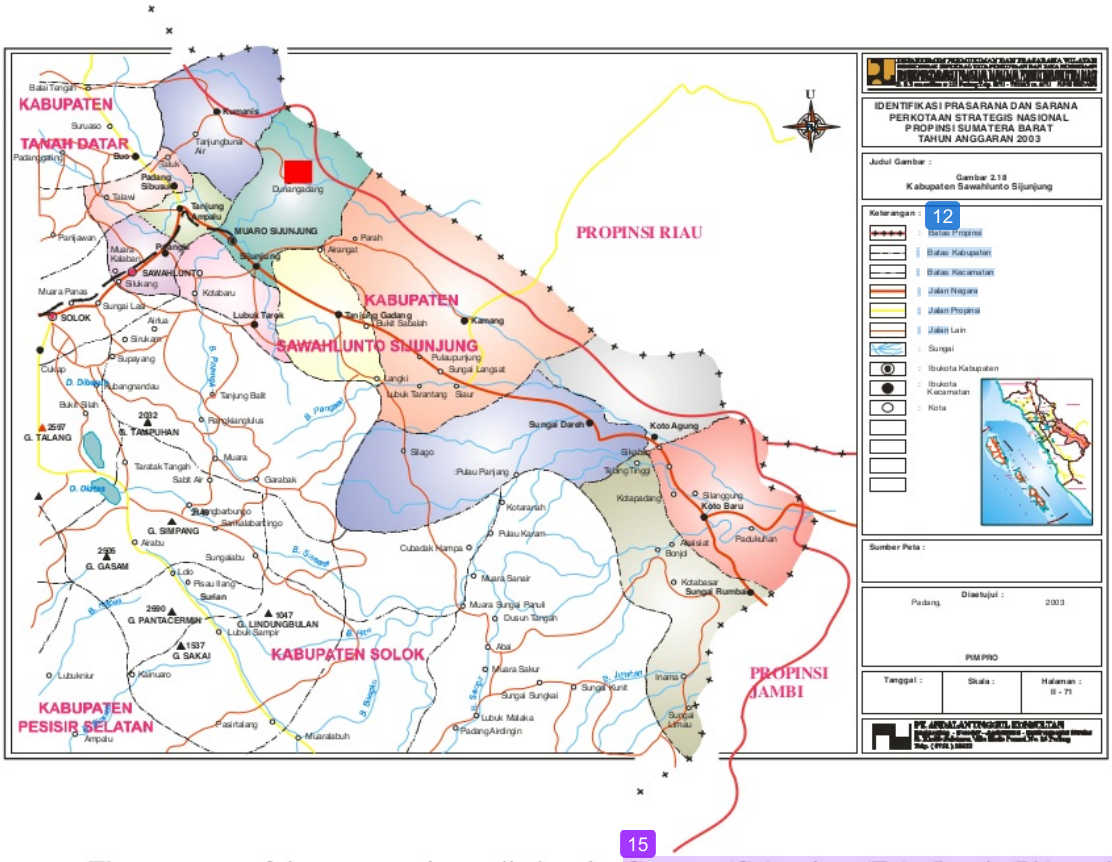
The higher the organic matter in a body of water, the pH will be lower. This is due to the amount of organic compounds that enter the body of water will affect the acidity of the waters (Scott and Sloman, 2004). Furthermore Kimmel, 1990 suggests that the Phytoplankton in the waters in growth requires the elements O, H, C, Si, N, CA, K, P, Mg, S, Cl, Na and Fe. In the process of photosynthesis in Jorgensen, 1986 suggested that the elements of N in the form of ionized ammonia and nitrate is required by the primary production. Therefore, the temperature and pH strongly influenced by the ionized ammonia in water to form an equilibrium with free ammonia (Boyd, 1990).

According to the Mining Management Team Without Permission (PETI) Ministry of Energy and Mineral Resources (2000), factors which lead to the presence of artisanal mining is triggered by a lack of jobs, boost the economy because of low income and poverty. This is used by investors to seek wealth by exploiting the local communities so that the onset of the artisanal mining activities. For the last five years the community has Sijunjung district gold mining in the watershed (DAS) Bars and Stems Kuantan and Ombilin Palangki. Gold mining is carried out by people in the area are mostly illegal mining. They do mining without regard to environmental aspects. At the watershed has been polluted, mercury in the watershed Ombilin River and Batang Palangki above the threshold, that is equal to 0.01035 mg / L. The use of high-powered equipment (40 PK) cause noise and air pollution due to exhaust gas CO (carbon monoxide) and CO2 (carbon dioxide). The situation of the river also occurs as a result of dredging and dumping of sand in the watershed. In addition to mining activities, in the watershed functioned for bathing, washing, toilet (MCK) and fishing activities. Mercury levels above the threshold of harm to the health of the population. Community engage in illegal mining without stealth, there are hundreds of tools operated but local governments are not firmly curbed the illegal mining activities. Therefore the aim of this research is to analyze the effect of conversion of agricultural land assets against illegal mining and pollution, biodiversity of the river, and the income of the people in the district Sijunjung West Sumatra, Indonesia.

2. Methodology

The study was conducted in July 2013 at a conservation area Kuantan River that passes through four districts, District of Sijunjung IV Nagari Koto Seven, and Kupitan.Through Nagari Silokek and Durian Tower Analysis of heavy metal content in the water is done at the Laboratory of the University of Bung Hatta. Analysis of water quality such as temperature, pH performed in situ while the DO, BOD, COD, TDS, TSS, brightness, hardness, alkalinity, Eksitu done.

1. The selected station is expected to represent the condition of the Kuantan River waters are made in the conservation area past the Tower District of Nagari Silokek Durian Sijunjung and district. IV Nagari along 12 km, so that the sampling in three areas of each station jailed 4 Km between stations of the two stations and three stations are: Station of the upstream part of the conservation area in Nagari Silokek and Durian Tower.
2. The two stations are the central part of the conservation area between the Silokek Nagari Nagari Koto subdistrict Durian Tower Seven.
3. Station three is the downstream end of the conservation and that Nagari Durian Tower District of Kupitan.



The content of heavy metals studied only Copper (Cu), zinc (Zn), Lead (Pb) and mercury (Hg), because prior to the first station there are people who do mining activities Gold Without Permission (PETI) that use materials containing heavy metals particular, because the production process involves a lot of chemicals.

Water sampling was conducted in July 2013 with two times water sampling taken at the surface, on each. Water samples were taken using a Van Dorn bottle sampler. Examples of water put into polyethylene bottles and preserved by the addition of HNO3 to pH ≤ 2 then analyzed in laboratory Bung Hatta University.

To determine the level of income Sampling was done by stratified random sampling to owners, investors and workers at each selected location. The number of samples for owners and financiers deliberately taken as much as 3 people in each district, to be taken as many as 20 workers. The data were analyzed descriptively and qualitatively against the owners, investors and workers. For biodiversity sampling is done deliberately to fishing in four locations with a sample of four people in each location, and interviews with the department of animal husbandry and fisheries, as well as community leaders Sijunjung district. The location and number of owners and workers can be seen in Table 2. And the number of fishermen in Table 3 below:

Table 1. The number of samples of the owners, financiers and Mine Workers in the District Sijunjung

No.	sub-district	Location	Landlord	financier	worker
1	Sijunjung	downstream	Malin Kociek	Malin Kociek	6
			Syahril	Syahril	8
			Heldi Andrizal	Heldi Andrizal	6
2	IV Nagari	headwaters	Siti Rahmah	Siti Rahmah	6
			Yunizar.S	Yunizar.S	8
			Radimas	Radimas	6
			Heldi Andrizal	Heldi Andrizal	6
3	Koto Tujuh	middle	Hairun Naim	Hairum Naim	6
			Bahrun	Bahrum	8
			Ali yunus	Ali Yunus	6
4	Kupitan	headwaters	Yulmaizar	Yulmaizar	6
			Muslim Anwar	Muslim Anwar	8
			Dalton	Dalton	6
	Jumlah		12	12	80

Source: Field Data 2013.

Table 2. The number of fishermen, community leaders and the Department of Animal Husbandry and Fisheries

No.	Sub-district	Location	fisherman	Community Leaders	Department of Animal Husbandry and Fisheries

1	Sijunjung	Downstream	4	3	3
2	IV Nagari	Headwaters	4	4	4
3	Koto Tujuh	Middle	4	3	3
4	Kupitan	Headwaters	4	3	3
	Jumlah	12	16	13	13

Source: Catching fish, community leaders, and the Department of Animal Husbandry and Fisheries

3. Data Analysis

The content of heavy metals measured descriptively, by comparing the content of heavy metals in the water with the water quality standards according to the PP. No. 82 of 2001 on water quality management and water pollution control class 3, the designation of water that can be used for aquaculture activities. As for the level of income do interviews directly to the owners, investors, and workers. For information on the type of fish that has been declining fish species at each site, interviews were conducted directly to the Department of Agriculture, Fisheries and Animal Husbandry Sijunjung district.

2. Results and Discussion

Based on the results of a study of heavy metals contained in the four districts with Kuantan river flows through the village conservation area and durian sieve silokek both in the upstream, midstream and downstream as shown in Table 3 below.

Table. 3 Quality Standard Results Value Heavy Metals in Water

Parameter	headwaters (Station 1) Value score ±	middle (Station 2) Value score ±	downstream (Station 3) Value score ±	Water quality standards class III PP. Decree No. 2001
Cu (mg/l)	1,223 ± 0,572[1]	1,086 ± 0,016[2]	0,803 ± 0,052[3]	0,02
Zn (mg/l)	0,659 ± 0,016[1]	0,361 ± 0,043[2]	0,503 ± 0,136[3]	0,05
Pb (mg/l)	0,926 ± 0,008[1]	0,485 ± 0,014[2]	0,591 ± 0,061[3]	0,03
Hg (mg/l)	0,108 ± 0,002[1]	0,092 ± 0,014[2]	0,022 ±0,003[3]	0,002

Explanation *:* Different superscript numbers behind the average figures between stations showed significantly different (P **<0.05)**

The content of Cu, at each station shows the difference between the stations 1,2 and 3. At station 1, the number of Cu metal pollution is quite high compared to station 2, and 3. This is

due more to the middle and downstream to the melting of the Cu metal . This is due to the heavy flow of tributaries. A similar trend has also been investigated by Shita (2005) in the Saguling where heavy metals Cu showed no difference between the stations. Heavy metal contamination of Zn occur mainly at station 1, but at station 2, and 3 more mengencer because of the heavy flow of tributaries. Furthermore, for heavy metals Pb occurs also differences between stations 1, 2, and three. However, at station 1 is greater (0.926 ± 0.008) compared to station 2, and 3. If we compare quality standard 0,03mg / l is much greater in station 1. The pollution comes from gold mining and fuel for the ship life absorb water dug mine. For heavy metals Hg at station 1 is quite high with an average of 0.108 ± 0,002[1] mg / l, while at station 2, and 3 has narrowed pollution. However, compared to the quality standards set by the government of PP. No. 82 of 2001, has exceeded the threshold. Similar research has been done by Polii and Sonya (2002) in the watershed Buyat Minahasa, where high Hg bladder caused by gold mining folk.

From Table 4 it is seen that the average temperature of the water in the four districts traversed by the rod at the location Kuantan Nagari Silokek conservation and the Durian Tower of the three stations, looks normal average is 27.5 ±, 490C. As noted by Effendi (2003) that the temperature of a body of water is determined by the depth of the water. Temperatures in the conservation area are relatively normal within their PP value. Republic of Indonesia No. 82 of 2001 for the cultivation of freshwater fishery. For pH water from three locations in the measure indicates the normal range, namely around 6-9. It is appropriate for biota and fish farming. Alkalinity of the three locations measured shows the difference between stations 1, 2, and 3. It is strongly influenced by the effluent into waters that are affected by human activities and natural factors. These results indicate that the river water unfit for cultivation activities caused been below the threshold was set at> 80 mg / L. DO values of the three stations show a difference. From the result shows that the DO has passed the minimum threshold of 4 mg / l. Furthermore, the conduct of the three stations shows differences the station 1 BOD no higher than station 2, and 3. This difference is due to the amount of the organic content of the waste Limbang gold mining. The same thing applies to the content of COD. Has exceeded the threshold. While Total Suspended Solid (TSS) is the highest at stations 1 and 3, where the three stations is derived from household waste, and station 1 is derived from the people's gold mine. For Total Dissolved Solid (TDS) shows the difference, but still below the specified bytes namely: 1000 mg / l. Results brightness different from one another in each location. Booth have shown above the threshold set by the government. The latter result is hardness. Hardness values of the three locations above the threshold indicate the quality standards set by the government is 350 mg / l.

Table. 4 The results of measurements of physical and chemical parameters on the conservation area

Parameter	Headwaters (Station 1) Value score ±	Middle (Station 2) Value score ±	Downstream (Station 3) Value score ±	The quality standard PP. No. 2001

Suhu	27,7 ± 0,35	27,5 ± 0,7	27,5 ± 0,49	27 ± 3℃
pH	6,28 ± 0,02	6,3 ± 0,12	6,32 ± 0,05	6 – 9
Akalinitas	20,385 ± 0,473	18,485 ± 11,462	25,92 ±	>80
(mg/l)	4,35 ± 0,07	4,47 ± 0,028	12,416	4
DO (mg/l)	4,23 ± 0,042	3,45 ± 0,07	4,57 ± 0,296	3
BOD (mg/l)	72,04 ± 12,72	58,205 ± 5,607	3,51 ± 0,58	25
COD (mg/l)	77,065 ± 3,372	46,445 ± 3,372	53,665 ±	50
TSS (mg/l)	124,22 ± 5,501	64,14 ± 13,307	33,113	1000
TDS (mg/l)	12 ± 2,82	27 ± 4,24	53,465 ±	>45
Kecerahan (cm)	82,465 ± 9,623	74,11 ± 19,685	29,479	350
Kesadahan			76,695 ±	
(mg/l)				

Source: Analysis of water quality Batang Kuantan

Based on the results of research conducted in four districts of the landowners and capitalists generally owned land as a direct investor in the gold mining concession. Sharing system conducted in four districts is determined by the type of mining tools. If done using dompeng ships are generally operating in a river system sharing the results as follows: Revenues minus costs consisting of: 35 liters of diesel oil / machine / day, the cost of the officers in USD. 200.000, if using boats, ships saplings cost Rp. 50,000, the cash cost of the machine to the village (for in Nagari Palangki) Rp. 250,000, after all these expenses incurred divided according to a new deal at each location: Landowners gain sharing 20%, 40% and Labour investors 40%. For direct investors as owners also issued tips to guard ships by 10%.

To dompeng without a ship as to the results of the survey in four districts kelapang obtained the following results: revenues minus the cost of gold mining production consisting of: the cost of oil 35 liters / machine / day. Money drink (coffee) Rp. 150,000, while the consumption borne by workers to bring food from home. Systems division of land owned 25%, 37.5% owner of capital and 37.5% of workers. For a machine operating at 10% payable by the landlord. For more details, the average income of people in the District Sijunjung either as owners, investors, and workers can be seen in Table 4 below:

From Table 4 above, it can be seen that the average landowner as the owner of capital so obviously earned income differences between owners and workers. Due to the high income owners and financiers are physically evident that owner have nice houses and the latest vehicles in each of their homes. While the worker also has a two-wheeled vehicles with a variety of brands. Based on field observations and interviews with traders in the market adjacent to mining areas, the market will look crowded on those days Saturday. This is due on Saturday that

workers receive their wages weekly and shop for the day. The market will look empty if the miners stop the activity or a holiday. The difference in income between the owners of one another are also due to the extent of land they have and the number of tools used during mining conducted as well as the location of the mine is located. It is also seen that the highest income earned owner who has a land area of 5 ha mines, 1 Ha, 0.5 Ha, and the lowest was owned by extensive mine 0:12 Ha. From the research it was clear that the area of land owned, the higher the level of income received. The impact of this high level of income gives effect to the economic sector households. But the real effect is visible damage to the land-mined land with an average in 4-11 meters. This damage causes large areas and untapped natural bent to the present.

Table 5. The average income in the district communities Gold Miners Sijunjung

No.	Sub-district	Village	broad Land / Ha	The average income of Landlord / Rp / Week		The average income of the Capital / Rp / Week		The average income of workers / Rp / Week / People	
1	**Sijunjung**	Muaro	5	Malin Kociek	9.000.000	Malin Kociek	18.000.000	6	3.000.000
		Muaro	0.5	Syahril	4.500.000	Syahril	9.000.000	8	1.500.000
		Durian Gadang	5	Heldi Andrizal	7.500.000	Heldi Andrizal	15.000.000	6	2.500.000
2	**IV Nagari**	Muaro bodi	0.45	Siti Rahmah	3.000.000	Siti Rahmah	6.000.000	6	1.000.000
		Palangki	1	Joni Surialdi	1.500.000	Joni Surialds	9.000.000	8	1.500.000
		Koto Tuo	1	Radimas	5.250.000	Radimas	10.500.000	6	1.750.000
		Mundam	1	Zul Nasri	1.500.000	Zul Nasri	9.000.000	6	1.500.000
3	**Koto Tujuh**	Tanjung	1	Hairun Naim	4.500.000	Hairum Naim	9.000.000	6	1.500.000
		Limo Koto	1	Bahrun	4.500.000	Bahrum	9.000.000	8	1.500.000
		Padang Laweh	5	Ali yunus	9.000.000	Ali Yunus	18.000.000	6	3.000.000
4	**Kupitan**	Pemuatan	1	Yulmaizar	4.500.000	Yulmaizar	9.000.000	6	1.500.000
		Batu manjulur	0.12	Muslim Anwar	750.000	Muslim Anwar	1.500.000	8	250.000
		Padang Sibusuk	1	Dalton	4.500.000	Dalton	9.000.000	6	1.500.000
		13		12		12		80	

This is consistent with the results of the study Refles (2012) suggested that gold mining has been done in the Kanagarian Mundam Way in wetland area of 18 ha and 17 ha of plantation area. Many miners did land reclamation after mining is done. At the mine that does not produce adequate amounts of gold, the land is generally in staying away so it cannot be used again for agriculture. It is in the long run can threaten agricultural self-sufficiency. Another effect is the destruction of the ecosystem of the river causes a reduction in the types of fish in the area.

On the other hand Ahyani research (2011) suggests that the level of damage to the soil at the site of gold mining suffered heavy damage and the level of physical environmental impacts such as soil degradation. The loss of nutrients needed by the plant growth, reduced surface water discharge, the high vehicle traffic makes it easy damaging roads, air pollution, and socioeconomic impacts. Socioeconomic impacts, many people switch professions of farmer gold miners, and many immigrants who come to mine so that it can lead to conflict, the fear of some people because of the gold mining potential erosion and sedimentation.

Furthermore Balifokus foundation (2012) argued that in essence, mining definite environmental impact. Small-scale gold mining impressed beneficial to society, but have a higher cost than the selling price, both in terms of health, environmental and social impact damage. If illegal mining to involve thousands of people, making it difficult to regulate because officers have become a powerful force.

The difficulty of controlling illegal gold miners, according Sujatmiko (2012) suggested that the allocation of funds has not budgeted District Secretary making it difficult to coordinate with relevant agencies. Lack of delegation of authority by the Governor to the Regent of licensing the resulting difficulty in counseling, supervision and even prosecution of illegal gold mining in the watershed (DAS). Based on field observations of the description of some previous researchers, the economic influence is clearly visible in terms of increased revenue greater with the illegal mining, but would bring negative effects of environmental degradation, land degradation, damage to watersheds. This condition is aggravated in the absence of land reclamation that has been used for gold mining will have an impact on food security in the future.

To biodiversity in river waters impact of illegal mining lower fish populations that live in the waters of the river in four sub-district as shown in Table 5 below:

Table 6. Four types of fish in the District of The Population Declining

N0	TYPE OF FISH	LATIN NAME	FISH OF THE DOWN POPULATION (%)
1	Crisp fish	*Labeobarbus sp*	60
2	Lesser spiny eel	*Macronagthus sp*	50
3	Puffer fish	*Tetraodon sp*	45
4	Hampala barb	*Hampala macrolepidota*	48
5	catfish	*Pangasius sp*	60
6	Vatani rohtee	*Mystus naemurus*	50

7	Orangeface angelfish	*Chromobotia macrochantus*	70
8	Gangetic scissortail rasbora	*Rasbora sp*	50
9	Squirrelheaded catfish	*Osteochilus microcephalus*	50
10	Pangas catfish	*Pangasius sp*	50
11	Clown knifefish	*Chilata sp*	60
12	Patrician wrasse	*Labiobarbus festivus*	50
13	Kapiek fish	*Cosmochilus falcifer*	50

Source: Catching fish, the community and the Department of Animal Husbandry and Fisheries

From Table 6 it appears that almost all kinds of fish in the four districts have an average population decreased (± 50%), the highest population decline is a type of Botia ornamental fish (70%). While the crisp fish, catfish, and balido population decreased by 60%. The types of fish due to the decline in population is economically has a high price in the market. This decline has caused the destruction of the habitats where they live is caused by illegal mining. This is consistent with the results of the study Mulyadi (2001) suggested that the environmental damage caused by vegetation Siak river water quality degradation due to pollution. This took effect on reducing fish populations and crustaceans along the banks of the river which is a habitat for other organisms that live in the waters of other sungai. Opinion proposed by Su and Rahim (2001) suggested that the problems in the sub-basin in the area caused Ogan by riverbank erosion, flooding, domestic waste and silting of the river. There is no special agency in charge and no rules are clear and technically extremely difficult terrain in efforts related to build zoning.

Conclusion

1. Land conversion of agricultural assets of illegal mining affect the environment will exacerbate water resource assets, and fish resources.
2. Test results against the results showed that heavy metals from mining gold was discovered hazardous substances in waters and exceeds a threshold such as Cu, Zn, Pb, and Hg.
3. Illegal mining affects the increase in people's income, the income will be higher if the owners and investors have vast land, mining equipment are many, and a good location.
4. The negative impact of the presence of illegal gold mining is environmental degradation, land degradation, and damage to watersheds.
5. Another negative impact is declining populations of fish in the river waters that threaten bio-diversity (biodiversity of fish) in the river waters.

Suggestion

1. There needs to be coordination between relevant agencies, led by the Governor and Regent in tackling illegal mining.
2. By law for gold mining is necessary so that any aspects of the law in case of violation in the implementation of the mining.
3. The need for conversion towards mining useful than left alone to productive things such as fish farming.
4. Need for further studies of the impact of illegal mining damage to the efforts of productive activities such as: floating net, cultivation of catfish, tilapia, and carp.

REFERENCES

Ahyani, M (2011) Effect of Gold Mining Activities Against Damage Condition In Mining Area Land Bombana People in Southeast Sulawesi.

Balifokus Foundation (2012) workshop practice small-scale gold mining (pesk) 9-11 February 2012 mercury free garden hotel Mataram Lombok Indonesia.

Boyd, C.E. 1990. Water quality in ponds for aquaculture. Birmingham Publishing Co. Birmingham 442 p.

Braioni, M.G; B, Gumeiero; G.Salmoiraghi, 2001. Leaf bags and natural leaf pack: Two Approaches to evaluate river functional characteristic. Internal Rev. Hydrobiol, 86 (4): 439-451.

Darmono. 1995. Metals in Biological Systems Beings. Indonesia- University Press. Jakarta.

Department of Mines and Energy of the Province of West Sumatra, 2004. Potential Minerals West Sumatra, Padang.

Directorate of Mineral and Coal, Directorate General of Geology and Mineral Resources, 2004. Guidelines for Development of Small Scale Exploitation Pertambanagan, Jakarta.

Effendi, H. 2000. Assessing Water Quality. For Environmental Management of Water Resources. Department of Water Resource Management. FPIK. IPB.Bogor.

Elfindri,. Bachtiar, Nasri. 2004. Labor Economics, Andalas University Press, Padang.

Gusrivono (2011) Padang Express. Please Picking Time in the Golden Glow Dharmasraya.

Integrated Team, Center for Mining Problems Without Permission (PETI), 2000, Issues Management Mining Without Permission (PETI), Presidential Decree No. Inplementasi 3 In 2000, Jakarta.

Jergensen, SE, 1986. Fundamentals of ecological modeling. Elsevier Science Publishers B.V., Amsterdam. 387 p

Kaplan, L and Newbold, 1993. The rule of monomers in stream ecosystem metabolism. In Aquatic Ecosystems: Interactivity of dissolved organic matter. Findlay and Sinsabaugh (Eds). Academic Press. New York. 99-120.

Kimmel, B, 1990. Ecological concepts. In Olem, H. And G, Flock, (Eds) Lake and Reservoir Restoration Guidance Manual.2nd edition.

Kurnia, I (2011) Control Over Mining Regions in the Perspective of Regional Autonomy (Analysis of Potential Conflict Management Gold Mine People Poboya in Palu).

Mulyadi, A (2001). Environmental Problems Vegetation Edges And His Role As Siak River Biological Indicators and Green Belt. Journal of Environment and Development 21 (4) 331-339; 2001. The Higher Education Center for Environmental Studies throughout Indonesia.

Palar, H. 2004. Heavy Metal Contamination and Toxicology. Publisher Rineka Reserved. Jakarta.

Pasaribu, A (2010) Analysis of Impact of Socioeconomic Against Gold Mining District of Batang Toru Communities in South Tapanuli.

Plii and Sonya (2002) in Shinta (2005) Heavy Metal Content of Cu, Zn, and Pb in Water, Tilapia (Oreochromis niloticus) and Goldfish (Cyprinus Carpio) in Keramba cage, Saguling, West Java, (Thesis) . Bogor. Faculty of Fisheries and Marine Sciences. IPB.

Rinaldi, A. (2013) Content of Heavy Metals in Water and Fish Baung Hemibagrusnemurus (CV) in Kuantan River Conservation Area District of the District Sijunjung Sijunjung.

Shita, F, S, 2005. Heavy Metal Content of Cu, Zn, and Pb in Water, Tilapia (Oreochromis niloticus) and Goldfish (Cyprinus Carpio) in Keramba cage, Saguling, West Java, (Thesis). Bogor. Faculty of Fisheries and Marine Sciences. IPB.

Sijunjung the decree No. 42 of 2010 Concerning the Medium Term Development Plan (RPJMD) District Sijunjung Year 2011-2015.

Su, MA and Rahim, SE (2001) Watershed Management Issues Musi-Related zoning. Journal of Environment and Development. 21 (4) 331-339; 2001. The Higher Education Center for Environmental Studies throughout Indonesia.

Sujatmiko, B (2012) Gold Mining Without Permission in the Watershed (das) Arut District of North Arut Seen From Law No. 4 of 2009.

Tarumun, SD and Devita, F (2012) Impact of Environmental Degradation on Socioeconomic aspects of Watershed Society in Siak, Riau Province, Pekanbaru.

Tjokrokusumo, SW (2008) Effect of Sedimentation and Turbidity In networking Food Flowing Water Ecosystem (Lotik). Researchers in the field Ekoteknologi Environmental Technology Center Agency for the Assessment and Application of Technology.

Attachment




Caption:
1. **M**ining activities**,**
2. Operational mining machine-**dompeng,**
3. Mining activities in Kuantan river**,**
4. The vehicle of gold miners**.**

ASSET TRANSFER FUNCTION EFFECT OF AGRICULTURAL LAND TO ILLEGAL MINING

ORIGINALITY REPORT

11%	4%	5%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Universiti Teknologi Malaysia Student Paper	4%
2	NURJANAH NURJANAH, TATI NURHAYATI, TAUFIK HIDAYAT, MONICA AGUSTINA AMELIAWATI. "Profile of Macro-Micro Mineral and Carotenoids in Pomacea Canaliculata", Current Research in Nutrition and Food Science Journal, 2019 Publication	1%
3	Husnah Husnah, Dessy Arisna. "LAJU DEKOMPOSISI BAHAN ORGANIK DAN PRODUKSI INVERTEBRATA AIR DI SUAKA PERIKANAN TELUK RASAU, SUMATERA SELATAN", BAWAL Widya Riset Perikanan Tangkap, 2017 Publication	1%
4	Submitted to Kwame Nkrumah University of Science and Technology Student Paper	1%

5	journal.ubb.ac.id Internet Source	1%
6	dspace.incdecoind.ro Internet Source	<1%
7	D Salman, R S Aisyah, A R Siregar, S Baba. "Coexistence mode of production based dairy cow supporting farming in producing biogas as renewable energy resources", IOP Conference Series: Earth and Environmental Science, 2020 Publication	<1%
8	seca.doe.gov Internet Source	<1%
9	journal.ipb.ac.id Internet Source	<1%
10	drum.lib.umd.edu Internet Source	<1%
11	Kangala B Chipasa. "Accumulation and fate of selected heavy metals in a biological wastewater treatment system", Waste Management, 2003 Publication	<1%
12	id.scribd.com Internet Source	<1%
13	pure.iiasa.ac.at Internet Source	<1%

14	worldwidescience.org Internet Source	<1%
15	www.tandfonline.com Internet Source	<1%
16	C. Visvanathan, S. Muttamara, S. Babel, R. Ben Aim. "Treatment of Landfill Leachate by Crossflow Microfiltration and Ozonation", Separation Science and Technology, 2006 Publication	<1%
17	Arman Harahap, Ternala Alexander Barus, Miswar Budi Mulya, Syafruddin Ilyas. "Macrozoobenthos diversity as bioindicator of water quality in the Bilah river, Rantauprapat", Journal of Physics: Conference Series, 2018 Publication	<1%

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	Off		