
Sand Mining and Water Pollution

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INTRODUCTION

In this world there is no perfect or harmonious relationships as for as human beings and their activities are concerned. A gain on something is a loss on another. The environment in which human beings live is exploited to meet their needs to survive. Environment means the physical factors of the surroundings of human beings including land, water, atmosphere, climate, sound, odour, taste, the biological factors of animals and plants and the social factor of aesthetics *(Rosnani and L C Min 2010)*. The ideal notion is any exploitation on the environment by human beings shall be sustainable and any excessiveness is to be avoided. However the word sustainable is really idealistic and difficult or made difficult to attain. Often human beings tend to resort to excessive or over excessive approaches toward the environment for their gains. In real world, profitability or economic survival dictates and leads to environmental degradation.

Thus this paper will look into one kind of environmental degradation namely water pollution. Water pollution is a serious issue given the fact that water is an essential element in the maintenance of all forms of life, and most living organisms can survive only for short periods without water. Since water serves as an essential resource that sustains lives on earth, changes in the natural quality and distribution of water have ecological impacts that can sometimes be devastating.

There are two main causes of water pollution, point and non-point sources. Point sources include sewage treatment plants, manufacturing and agro-based industries and animal farms. Non-point sources are defined as diffused sources which among others include surface runoffs, agricultural activities and mining activities *(Rosnani and L C Min*

2010). The focus of this paper is to see the relationship between water pollution and one of its non-point sources which is sand mining. Sand mining is the removal of sand from their natural configuration. Sand is used for all kinds of projects like land reclamations, the construction of artificial islands and coastline stabilization. These projects have economical and social benefits, but sand mining can also have environmental problems. Environmental problems occur when the rate of extraction of sand, gravel and other materials exceeds the rate at which natural processes generate these materials. The morphologies of the mining areas have demonstrated the impact of mining with the prowess to destroy the cycle ecosystems *(M A Ashraf et al., 2010)*

Sand Mining

Sand falls under the wide definition of “land” under the National Land Code [Act 56 of 1965]. As provided under section 5 of the National Land Code, “land” includes –

a) that surface of the earth and all substances forming that surface;

b) the earth below the surface and all substances therein

Under the same section, sand is further classified as rock material. Rock material is defined under section 5 of the National Land Code which means *‘any rock, stone, gravel, common sand, common earth, common laterite, loam, common clay, soil, mud, turf, peat, coral, shell, and other rock materials within or upon any land, and includes processed materials therefrom, other than minerals defined under any written law relating to mining which is for the time being in force’*.

Sand Mining is a process where sand is extracted, removed, and transported. Any extraction, removal and transportation of the rock materials requires a permit sanctioned by the State Authority. The issue of the permit comes with charges in the mode of royalty, deposit, and other charges prescribed by the State Authority to be paid as revenues to the state. Apart from other sources of revenue to the state such as quit rent and land premium, the royalty for extraction, removal and transportation of rock materials contribute significantly to the state's coffer. As mentioned earlier, the issue of the permit is prescribed and regulated by the National Land Code which includes the management and the enforcement of every permit and related powers are given to the officers such as Settlement Officer, Land Administrator and State's Director of Land and Mines appointed under the law.

A proprietor of any alienated land is entitled to exclusive enjoyment of his land which includes the right to use any of the rock materials within his land. The permit is required when he wants to extract, remove and transport the rock materials across the boundary of his land. Apart from the royalty paid to the state, there are rules and regulations which govern the permit. The rules and regulations which are laid down by the authorities serve as conditions to be observed by a permit holder. In case of any default against the conditions, the deposit paid to the state may be forfeited and may render the permit to be cancelled by the State Authority. The issue of rock material permit under the National Land Code is the absolute discretion of the State Authority. The State Authority reserves the right to approve or reject any application referred to it with or without relevant recommendations from related departments or agencies such as Drainage and Irrigation Department, Department of Environment, State Water

Authority and local councils. However there is legal limitation on the requirement of permit to extract, remove and transport the rock materials. The legal limitation refers to exception or exemption to the proprietor of certain alienated lands to obtain a permit in order for him to extract, remove and transport any of the rock materials. There are land titles with special condition given to the proprietor(s) of first grade lands which exist in certain states in Peninsular Malaysia namely Pulau Pinang, Malacca and Negeri Sembilan. The proprietor of the said lands **has the right to remove without licence beyond the boundary of his land any rock materials or jungle produce**. This privilege is given upon alienation of the lands under the previous land laws before the National Land Code came into operation which was prior to 1966. The privilege is acknowledged by the National Land Code specifically under the provisions of section 4 of the Code. According to the provisions, *'nothing in the Act (National Land Code) shall affect the past operation of, or anything done under, any previous land law or, so far as they relate to land, the provisions of any other law passed before the commencement of the Act*. *Provided that any right, liberty, privilege, obligation or liability existing at the commencement of the Act by virtue of any such law shall, except as hereinafter expressly provided, be subject to the provisions of the Act'.*

Water Pollution

Water is the main element which constitutes two-third of the earth. All living creatures depend on water to survive. Sources of water include sea, rivers, canals, lakes, streams, and underground water. The functions of water are enormous from natural habitat, drinking source to generating of energy. The development of human civilization historically depended on water. Since human beings need water to survive, the interaction between human beings and water sources becomes unavoidable. The interaction has to be gentle so that necessities of human beings can be fulfilled with minimum exploitations of the water sources. Over exploitation will bring damages not only to the human beings but other living creatures like animals, aquatic lives and habitat.

The pollution on water resources such as rivers and storage reservoirs caused by human activities such as sand mining at the upstream affect the yield of water in terms of quantity and quality. The sources of pollution point and non-point have to be seriously dealt with in order to avoid curative measures which are very costly in terms of money and time spent. An interesting fact to be considered; profit or monetary gain from human activities can be easily quantified but the damage on water sources caused by the activities will take time to be realized. Since the activities such as sand mining is permitted by law, then the problem of pollution is almost inevitable. Often the pollution on water sources is compromised and has become routine activities or job scopes for certain governmental departments or agencies to be dealt with. Pollution of the water is very tangible which is evident by the colouration of water which in most rivers and streams in the mining area varies from brownish to reddish orange. With this problem at

the upstream, the water intake point is adversely affected. Not only the quality of water significantly deteriorates, the volume also drops. As a result, it brings shortage to the amount of water stored and at the end it disrupts water supply to consumers.

As a non-point source of water pollution, sand mining not only affects the quality and quantity of water but also the rivers and streams regimes. When the regimes are heavily disturbed, erosion occurs and the water flow changes. These problems trigger bigger problem which is flooding *(M A Ashraf et al., 2010)*. Neighbouring lands especially at the downstream are in danger since they are exposed and connected to the problems. The pollution which starts as environmental has become social and economical in nature.

Analysis and Discussion

In this concise paper, the focus will be on legal sand mining activities but yet uncontrollable. There are various spots or locations in the Mukim of Pantai in the district of Seremban, Negeri Sembilan. In this area, there are number of alienated lands with special condition. The condition as mentioned earlier authorizes the grantee (proprietor) of the land to remove beyond boundaries of his land any of the rock materials without licence (permit). Sand is one of the materials. Most of sand mining activities in the area located at the upstream of Sungai Terip Dam which supplies treated water to most of Seremban areas. The sources of raw water to Sungai Terip Dam are from number of rivers at the upstream namely Sungai Ngoi-Ngoi, Sungai Batang Penar and Sungai Jerlang. These rivers run or cut across number of special conditioned alienated lands

and become part of the alienated lands. Since the rivers form part of the alienated lands, the soil is very sandy and thus sand deposits are enormous. The location of Seremban as a district is very strategic as it forms part of the Greater Klang Valley. This strategic location makes Seremban as viable supplier of sand for all kinds of projects not only in the district but also other areas in the neighbouring state of Selangor such as Sepang, Beranang, Ulu Langat and Semenyih.

High demands of sand have prompted the proprietors of the lands getting involved in sand mining. Most of the proprietors are not directly engaged in sand mining since they engage second party as contractor to undertake the business on their behalf. The proprietors have the authority as owners of the lands but the capital and operational expenditures are borne by the contractors. With this mode of business, the proprietors get little revenue while bigger or larger income goes into the contractors' coffer.

The lands are agricultural in nature but due to the sand mining activities carried out, the lands have been severely exploited in order to ensure high quantity of sand stockpiles available. As a result, it is very difficult to toil the lands and to restore them to their original state of nature has become almost impossible. The unscrupulous contractors start to lay down problems to be dealt by the authorities who face difficulty in controlling and regulate them.

In normal circumstances, the issue of control and regulating sand mining does not pose a big problem to the authorities since the permit or licence for sand mining is issued by the State Authority. The issue of the permit or licence comes with number of conditions to be observed and upheld by the permit holder in order to be operative.

Should there be any default or breach on the conditions, the authorities such as Land Office, State Water Authority, Drainage and Irrigation Department and Department of Environment have the power to enforce and the permit is liable to be suspended or terminated.

However this is not the case as far as the lands with special condition are concerned. Since the issue of permit or licence is non-existent, sand mining has become difficult to be dealt with and enforcement can hardly be undertaken. Sand mining activities in the area have polluted the rivers. Physical impacts of sand mining include reduction of water quality and destabilization of the river bed and banks. The assessment of water quality undertaken by Syarikat Air Negeri Sembilan Sdn. Bhd. (SAINS) shows that water at the intake point channelled from Sungai Ngoi-Ngoi, Sungai Jerlang and Sungai Batang Penar has been highly polluted due to high concentrations of suspended particles. Wash-water discharge, storm runoff, and dredging activities from improper sand operation increase the turbidity of the rivers. Turbidity is generally greatest at dredging sites or wash-water discharge points. Increased short-term turbidity at the mining site is due to re-suspension of sediment, sedimentation due to stockpiling and dumping of excess mining materials and organic particulate matter and oil spills or leakage from excavation machinery and transportation vehicles. Increased riverbed and bank erosion increases suspended solids in the water at the excavation site and downstream *(M A Ashraf et al., 2010)*.

SAINS has lodged a complaint on the reduction of raw water quality to the State Water Authority. Highest score reaching at 10,000 NTU compared to Ministry of Health's standard : 1, 000 NTU. This has caused numerous incidents of water pump

breakdown and damage due to high suspended solids. The water level at Sungai Terip Dam also has drastically reduced since the raw water intake from the dam has escalated while water intake from the polluted rivers has reduced or stopped. Based on the investigations undertaken, the sources of the increase in the turbidity were from sand mining operations at the upstream. The suspended solids not only affect water users but the aquatic ecosystems as well. With the presence of suspended solids, water treatment costs increase significantly.

In order to address the problem, Negeri Sembilan's Government have formed a task force to monitor and control sources of raw water pollution. Series of meeting and discussion among the relevant authorities have taken place with number of decisions been agreed upon. The State Water Authority with the cooperation from Drainage and Irrigation Department will impose stringent technical requirements to be met by the sand mining contractors. A meeting will also be called up by the Land Office of Seremban through which the contractors will be notified on the technical requirements and the contractors have to build necessary and adequate sedimentation ponds based on the standard prescribed by the authorities. Despite the measures being undertaken to tackle the problem, the biggest issue persists. The measures are mainly administrative in nature and without legal control, enforcement cannot be carried upon. The contractors' refusal in following the requirements set by the authorities and their unwillingness to cooperate are not punishable. Since the lands in question have special condition, the right and liberty granted to the proprietor of the land are therefore very powerful. The strength of the land titles provides the proprietor invincibility and this tend to be destructive as it inflicts public safety and health.

Conclusion and Recommendations

Sand is a vital natural material which is widely used in numerous industries and projects *(M N Saviour, 2011)*. Sand as a commodity is a treasure to state governments in Malaysia because sand mining as source of income contributes handsomely to state's fund from the royalty paid by the permit holders. A scarcity in sand supply will disrupt the implementation of physical projects which will also affect the economy and the society. Since sand mining is regulated by the State Authority, the issues of monitoring, supervision, control and enforcement are too crucial to be neglected. Most of sand mining operations are carried in-stream or very near to sources of water like rivers that have to be protected from sources of pollution. With sand mining operations going on especially at the upstream, pollution is almost inevitable.

There are adequate laws and regulations to deal with sand mining operations which are permitted by the authority or that are illegal. In terms of monitoring, supervision, control and enforcement, the important part that is lacking is coordination and cooperation. Often the burden to oversee and enforce should there be any default or infringement of law is left to land office simply because sand mining is regulated by the land office on behalf of the State Authority. The threat to the interest of the public such as water pollution issue deriving from sand mining cannot be handled by land office solely. The provisions and powers exercisable under the National Land Code has proven to be ineffective in dealing with sand mining activities carried out on lands with special condition. The privilege or liberty given under the National Land Code proves to be hazardous and threat to public safety. There is very urgent need for the State Authority to consider other alternatives in order to combat the problem. The alternatives

can be considered by the State Authority among others include to acquire the lands in question for public purpose, or to impose planning permission to be obtained under the Town and Country Planning Act 1976 [Act 172] before any sand mining activities can be carried out, or to apply for a Court injunction or Court order to stop the activities that could pose serious threat to public safety and health. The determining factor to consider these alternatives is the political will on behalf of the government for the benefits of the people.

River water quality and pollution control need to be addressed urgently since 98% of the total water use originates from the rivers. Almost all of the investments in water related infrastructure in Malaysia depend on reasonable quality river waters. As river water pollution increases, it leads to three effects, namely:

- increases water ‘quantity scarcity’ since there is lesser volume of good quality water available for use;
- higher water treatment costs due to the presence of new pollutants and an increase in the concentration of existing pollutants; and
- erodes the ecological health of the water bodies and the surrounding eco-systems, affecting aquatic lives and habitat, and recreational activities (Keizrul 1999)

Weak governance is also a factor contributing to depletion of water resources. The socio-economic significance of mining operations is often overlooked and there is a need to protect its economic and social benefits *(M N Saviour, 2011)*. The necessity to clearly understand the far-reaching effects of such operations is the responsibility of every conscious and sensible individual of this country. Capitalism nearing its doom is cunning and brutal, it will seek all possible means to continue in control since the capitalists are in a desperate spree to claim their state on the natural resources of earth *(M A Ashraf et al., 2010)*.

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