RISK ASSESSMENT

The possible risks in the case of river sand mining projects are erosion, inundation/floods, accidents due to vehicular movement, Drowning, accident during sand loading and transporting etc. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine should be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions should be such as not to impair his working efficiency. This is possible only when there is adequate safety in mines. Hence, mine safety is one of the most essential aspects of any working mine. Safety of the mine and the employees is taken care of by the mining rules & regulations, which are well defined with laid down procedure for safety, which when scrupulously followed safety is ensured not only to manpower but also to machines & working environment.

DEFINE ENVIRONMENTAL RISKS

To under the environmental risk assessment it is important to familiar both the terms *i.e.* Risk and Hazard. The definitions of environmental risk are as follows:

(a) Risk: Risk is an actual or potential threat of adverse effects on environment arising out of an organization activity.

(b) Hazards: Hazard is the potential to cause harm. An environmental hazard is a generic term for any situation or state of events which poses threat to the surrounding environment.

Objective of Risk Assessment

Identifying hazardous activities

Assessment of risk level and severity in different operations

Identification of control measures

Setting monitoring process

Reduce the impact of mishaps of all kinds

Reduce the inherent potential for major accidents.

Methodology of Risk Assessment

Risk assessment is mainly based on the environmental impact of various parameters. The methodology of risk assessment will involve following steps as:

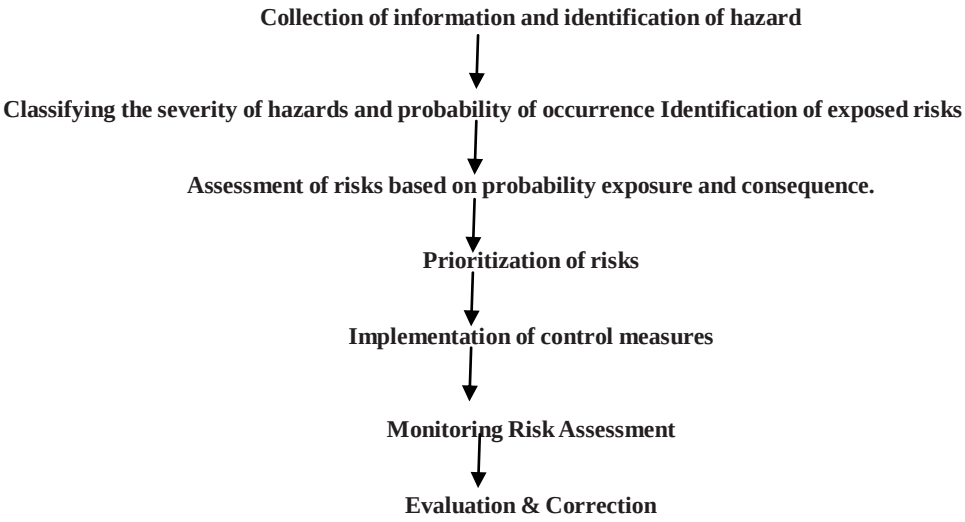

Figure - Methodology of Risk Assessment

Assessment of Risks & Mitigative Measures

Hazard Identification

Major Risks involved in River Bed Mining are following:

1. River Bed Inundation,
2. Dewatering,
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4. Possible risks due to failure of pit slope & its control
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6. Blanketing of River bed Suspended organic & Inorganic solids,
7. Uneven/ Irregular mining of sand or bajri
8. Accident due to Vehicular Movement
9. Accident during mineral loading and transportation
10. Failure of machinery

Mitigation Measures

A. Possible Risks Due to Inundation/Floods & Its Control

Mining will be done during the non-monsoon periods; therefore problem of inundation/floods is not likely to happen. There was no incidence of inundation/floods reported from the area so far. River is seasonal hence flows only in monsoon season.

B. Dewatering

The state government rules permits mining upto depth of 3m or 1m above the water level whichever is achieved earlier. The mining at site will be done till 3m deep only from the surface of river channel whereas the ground water flows at 8-10m below surface of river channel. Hence no dewatering is required. During mining, no ground water table will be intersected at all.

C. Drowning, if Any

There are no possibilities of drowning in the river, mining operation carried out in dry bed only. All mining activities will be stopped during the monsoon season. The mining operation will be carried out under strict supervision of competent person and only during dry season. Deep water zones in the river will be identified and enclosed with barricades. No go zone will be clearly marked and shall be aware to the mine workers.

D. Possible Risks Due to Failure of Pit Slope & Its Control

Pit will be created of limited depth only *i.e.* 3m thus the chance of failure of pit slope is marginal. However pit slope of working bunch will be kept under permissible limit which will not be more than 30degrees.

E. Soil Erosion

There is no top soil in the core zone. No mining will be done within 7.5 m from the either side of river banks to maintain its protection. Mining will proceed along the river in the direction from downstream to upstream in each block. No mining will be done across the river's nalla's. However plantation will be carried out along river banks in safety zone to protect banks and prevent soil erosion.

F. Blanketing of River bed Suspended organic & Inorganic solid

River Bed mining causes blanketing of River by suspended organic & Inorganic solids in overlaying water. Slope stabilization and time to time slope stability monitoring along with slope failure study will avoid this.

G. Uneven/ Irregular mining of sand or bajri

Due to uneven/ irregular thickness of sand bed, river bed mining may result in ponds

to develop. Excessive mining can change River direction & geometry altering recharging capacity of replenishment. Proper management of even excavation will overcome this.

H. Accident due to Vehicular Movement and their Mitigation Measures

- Possibilities of road accidents are possible due to rash driving.
- Possibility of overloading may injure the passerby public.
- The possibility of accident during vehicular movement in the mine in case pathway is not compacted or movement is at the embankment.
- All transportation within the mining lease working should be carried out directly under the supervision and control of the management.
- The vehicles will be maintained in good condition and checked thoroughly at least once a month by the competent person authorized for the purpose by the management.
- Road signs will be provided at each and every turning point up to the main road (wherever required).
- To avoid danger while reversing the equipments/ vehicles especially at the working place/loading points, stopper should be posted to properly guide reversing/spotting operating, otherwise no person should be there within 10m radius of machine.
- The maximum permissible speed limit should be ensured.
- Overloading of material will be avoided.
- A statutory provision of the fences, constant education, training etc. will go a long way in reducing the incidents of such accidents.

I. Accident during Mineral Loading and Transportation

- The mineral will be load in the trucks mechanically *i.e.* by Poclain and JCB. There is a possibility of injury to the person during loading operation at mine.
- There is a possibility of riverbank collapse.
- There is a chance of falling of animals/human into pits in river bed by overlooking of fenced area near working.

J. Failure of machinery

- Records will be maintained and updated of all the machines used at the mine site.
- Periodic maintenance and conditioning of the machines will be carried out under expert supervision.

K. Other Possible Measures to Avoid Risks/Disaster Due To River sand Mining

- Unwanted material including mineral or spillage (if any) should not be stacked on the banks as it will hinder the flow of water in monsoon season.
- Every mining block will have clearly identified approach road/ entry points into the rivers-nalla and similarly the exit points.
- Excavation will be carried out up to a maximum depth of 3 meters from surface of sand deposit and not less than one meter from the water level of the River channel whichever is reached earlier.