International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 8 Issue 12, December-2019

Study on Environmental Impact Assessment of the Sugar Industry

Jaydeep S. Kumbhar
Department of Technology, Shivaji University, Kolhapur

Shrikant M. Bhosale
Department of Technology, Shivaji University, Kolhapur

Abstract- **Impact centrality assurance is recognized as a basic EIA movement, but too as being ineffectively caught on and having profoundly variable hone. A great affect centrality assurance makes a difference to distribute assets proficiently when planning relief measures, as well as make express the esteem premise for choices, two crucial characteristics to back decision-making pointed at accomplishing maintainability. The challenges of sugar industry contamination and squander EIA is driving to debasement of its quality. Natural contamination incorporates a extraordinary affect on human being as well as over the society. It unfavorably impacts on the human health or public wellbeing, creatures and plants, so to play down the affect and contamination by controlling and applying plane, arrangement, squander administration technic like reuse and reuse of squander which is created in sugar industry and decreasing squander (EIA) is required. Also the costs of a project so that development duly considers environmental preservation besides economic and other factors. Survey of row material of industry in also important part of EIA the growth of crop of sugar can yearly cost and profit and other recycle material from sugar can like bagasse, press-mud, fuel, natural fertilizer ,should be maintain with pollution control devices and overcome minimum to zero pollution to overall environment.**

Keyword: Environment impact, Reduction of wastes generated by sugar industry.

I. INTRODUCTION

Environmental affect appraisal (EIA) could be a prepare of distinguishing, anticipating, assessing and relieving the biophysical, social, and other pertinent impacts of advancement recommendations earlier to major choices being taken and commitments made. These thinks about coordinated the environmental concerns of formative exercises in to the method of decision-making. The EIA handle in India was made required and was moreover given a authoritative status through a notice issued by the service of environment and woodlands in January 1994. The data created from the EIA is provided to reasonable decision-makers who join such contemplations into choices with respect to the proposition. In this way, EIA can advise improvement and diminishes natural hurt, all whereas expanding venture benefits. Waste reusing and its utilize as a soil conditioner/agricultural reason is the most excellent strategy for the administration of mechanical squanders.

India is the second-largest maker of world's sugar after Brazil and biggest customer of the world. The sugar process stores these squanders in open areas, which contaminates the natural environment of that zone. Vermicomposting can be an elective innovation for changing over sugar industry squanders into profitable excrement. Worms ingest, break and process squander and changes over into better, microbial dynamic fabric by the action of worms and organisms known as Vermicomposting. Vermicomposting is progressively considered in agribusiness and cultivation as a promising elective to chemical fertilizers. In expansion, renewable vitality can contribute to vitality security, fuel expansion and provincial improvement, as well as relieve natural issues related to abuse, preparing and transport of fossil fills. Natural Affect Evaluation (EIA) may be a key angle of many large scale arranging applications. It may be a strategy which is implied to assist us get it the potential natural impacts of major improvement recommendations. Shockingly, both the method and the result of EIA can be complex and befuddling taking off neighborhood communities uncertain as to how a improvement might influence them.

This report is planning as a wide presentation to the Natural Affect Appraisal (EIA). The fabric is drawn from directions, circulars and guidance and is designed to assist people get it what EIA is and in what circumstances it ought to be connected. The report isn't intended to supply direction on how to get ready an EIA. The in general topic of this report is to energize nearby communities to lock in within the EIA handle. Specialists don't continuously know the leading and by disregarding nearby information their choice may have deplorable result for neighborhood individuals living close advancement sites. Impact expectation could be a exceptionally imperative marvel in assessing the naturally potential antagonistic impacts for any proposed venture. The affect expectation is continuously carried out beneath most exceedingly bad conceivable conditions so as to relieve or to kill the Natural dangers. These expectations hence calculated are superimposed over the baseline information (the quality of Environment within the region of the extend location) so as to calculate the net affect on the Environment after the extend comes into production. The toxins transmitted into the air get weakened instantly and is transported and blended with the encompassing discuss. The natural impacts can be categorized as essential and auxiliary. Essential are those which are straightforwardly ascribed to the venture and auxiliary impacts are those which are by implication actuated due to essential impacts and incorporate those related with venture & socio-economic status.

II. METHODOLOGY

Collection of previous data

The Products & Raw Materials

List of Product

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 8 Issue 12, December-2019

- Sugar : Refined Sugar, Molasses , Bagasse ,Press Mud etc.
- Co-Gen : Electricity
- Distillery: Rectified Spirit (RS) and Ethanol .

To analysis of problem regarding to EIA and improvement.

- The extra proposed movement would be executed within the existing premises which Bolster satisfactory gear, partnered foundation, water and electricity.
- Fresh water utilize will be minimized, as the condensate water will be accessible from cane Juice dissipation from sugar production line unit.
- Primary, Auxiliary and Tertiary treatment units given within the existing ETP on location & ETP overhauled beneath development activity.
- There is no any discuss contamination due to development of refinery unit as biogas is source of fuel. Too, there's Electrostatic Precipitator (ESP) establishment as Discuss Contamination Control (APC) equipment.
- Captive utilize of dangerous and strong squander generated.
- Provision of fir battling framework and fire hydrant system.
- Direct and circuitous work openings would be amplified to the adjacent resident.
- Fire protection and safety measures would be provided to take care of fire and explosion hazard. The proposed project would be implemented by adopting latest technologies and equipment thereby minimizing the pollution load in Environment.

Present situation and future development in EIA.

Industrial waste management

Industrial Effluent –

Profluent from existing and development exercises of sugar and co-gen is treated in existing ETP to be overhauled beneath extension action. The ETP comprises of Essential, Auxiliary and Tertiary treatment units. Mechanical Oil Skimmer, Bar Screens, Two Anaerobic Tidal ponds, Two Air circulation Tanks with Diffused Air circulation Framework, Two Clarifiers, Tertiary Treatment within the frame of Double Media Channel & Centrifuge for slime drying. The exchange emanating created from existing and extension exercises of sugar production line and persuasive. Unit might be treated in existing etp to be overhauled beneath extension action. The ETP Comprises of essential, auxiliary and tertiary treatment unit operations viz. Mechanical oil Skimmer, bar screens, two anaerobic tidal ponds, two air circulation tanks with diffused Air circulation framework, two clarifiers, and tertiary treatment within the frame of double media channel & Centrifuge for slime drying. For refinery extension action, numerous viable evaporator (mee) might installed for the treatment of spent wash.

Emissions –

The unit employments bagasse & biogas as a source of fuel. Electrostatic Precipitator is utilized as discuss contamination control equipment.

Hazardous waste –

The perilous squander created from existing and extension. Exercises is utilized oil to the tune of 0.5 mt/m. Same might be reused in boiler

Solid waste –

Solid squander produced from existing and extension exercises within the Shape of ETP slime to the tune of 5.0 mt/m. The same might be utilized for bio-composting.

Solid Waste Management:

The solid waste would be generated in the form of ETP Sludge to the tune of 5.0 MT/Month and Boiler ash is to the tune of 1717 MT/M. The same shall be utilized in bio-composting process along with spent wash and press mud and sold to brick manufactures.

Power Requirement & Supply / Source:

The proposed extend fulfills the control prerequisite through proposed co-gen plant of 4 MW capacity in industry itself. To think about and analyze issue arrangement with economy

To study and analyze problem solution with economy.

Policy to be Adopted:

The development of Sugar, Co-gen & Refinery venture would be actualized within the existing Premises; there are no restoration & resettlement issues involved.

Project schedule & cost estimates

No major development would be done, since most of framework would be utilized from existing unit. Estimated Extend Fetched: The assessed taken a toll towards proposed development action would be Rs. 110 Crores for Sugar, Co-gen & refinery unit. To ponder and get illuminate the open wellbeing awareness

To study and get solve the public health awareness

Risk assessment

Industrial mishaps result in awesome individual and budgetary misfortune. Overseeing these coincidental dangers in today's environment is the concern of each mechanical unit, since either genuine or seen episodes can rapidly jeopardize the budgetary reasonability of a trade. Numerous offices include different fabricating forms that have the potential for mishaps which may be disastrous to the plant, work drive, environment& public. The fundamental objective of the hazard evaluation consider is to propose a comprehensive but basic approach to carry out chance investigation and conducting possibility thinks about for businesses and arranging and administration of mechanical model risk investigation consider in Indian context. Risk analysis and risk assessment hazard evaluation ought to give points of interest on Quantitative Hazard Appraisal (QRA) methods utilized world-over to decide hazard postured to individuals who work interior or live close perilous offices, and to help in planning compelling crisis reaction plans by depicting a Calamity Administration Arrange (DMP) to handle onsite and offsite crises. Thus, QRA is an important strategy for making educated risk-based handle security and natural affect arranging choices. Usually crucial to any facility-siting decision-making. QRA whether, site-specific or risk-specific for any plant is complex and needs broad consider that includes prepare understanding, danger distinguishing proof, result demonstrating,probability data, vulnerability models/data, local weather and terrain

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 8 Issue 12, December-2019

conditions and local population data. QRA may be carried out to serve the following objectives.
1. Recognizable proof of security areas
2. Recognizable proof of danger sources
3. Era of coincidental discharge scenarios for elude of dangerous materials from the facility
4. Recognizable proof of helpless units with response to endanger indices
5. Estimation of harm separations for the coincidental discharge scenarios with response to Greatest Valid Mishap (MCA) analysis
6. Risk and Operability ponders (HAZOP) in arrange to recognize potential disappointment cases of critical Consequences
7. Estimation of likelihood of events of perilous occasion through blame tree examination and Computation of unwavering quality of different control paths.
8. Appraisal of chance on the premise of over assessment against the chance worthiness Criteria pertinent to the situation
9. Suggest risk mitigation measures based on engineering judgment, reliability and risk analysis Approaches
10. Delineation / up-gradation of Disaster Management Plan (DMP).
11. Safety Reports: with respect to external safety report/ occupational safety report
12. The risk assessment report may cover the following in terms of the extent of damage with resource to.
MCA and depiction of hazard mitigations measures with an approach to DMP.
Hazard distinguishing proof - recognizable proof of perilous exercises, perilous materials, Past mischance records, etc. Hazard measurement - result investigation to evaluate the impacts of Chance Introduction, Chance Relief Measures, Catastrophe Administration Plans.
Predictive strategies for evaluating hazard ought to cover all the plan eagerly and working parameters to evaluate hazard in terms of likelihood of event of dangerous occasions and size of its consequence.

EIA study consisted of following main steps:
Identification and Evaluation of Impacts
Various impacts likely to happen due to the proposed extend on the environment were distinguished. These impacts were evaluated for their importance based on the foundation natural quality within the region and the greatness of the affect. All components of the environment were considered, impacts were assessed in quantitative and subjective terms for two scenarios with EMP and without EMP utilizing network method. Environment Administration Plan Based on the affect recognized, an fitting natural administration procedure was developed and displayed within the shape of EMP. The EMP comprises of the different approaches, control measures, etc. For decrease of basic natural impacts emerging out of the proposed project.

III. STUDY AREA

Shree Datta Sahakari Sakhar Karkhana Ltd proposes to expand the sugar factory capacity from 7500 TCD to 9000 TCD. The industry follows hundred percent recycling of excess condensate and as such fresh water requirement for process is Zero. The domestic consumption of water would be 1000 Cum/day and the process water for its Distillery unit would be 800 Cum/day. Thus the total fresh water requirement is 900 Cum/day even after expansion.The effluent generation would be 332.23 Cum/day even after expansion as compared to 324.25 Cum/day for its present crushing capacity of 7500TCD. This could be achieved due to complete recycling, reuse and dry washing practices followed by the industry. The Industry draws steam from Urjankur Shree Datta Power Company limited as per the bilateral agreement for establishing 36 MW power plant. At present 72T/hr of Baggase is received to generate 180T/hr of steam by Urjankur Shree Datta Power Company limited which in turn supplies 138T/hr of steam to Shree Datta Shetakari SSK Ltd for its Sugar factory and Distillery operations i.e. for sugar process 128T/hr Distillery 10T/hr. Even after expansion of the sugar factory capacity from 7500TCD to 9000TCD, the steam required shall remain unchanged as 128T/hr for sugar unit as it is proposed to reduce steam consumption from 39% to 34% per ton of cane crushed by modernizing the process operations.
The power requirement for 7500TCD and 9000TCD shall remain same as 176400KW/day. Shree Datta SSK . provided full pledged ETP for sugar effluent and also for excess condensates. The treated sugar factory effluent along with spray pond over flow is used for irrigation on 1000acres of land. The excess condensate is used as process water.The environmental status study of the project area is surveyed for ambient air quality. Noise levels, Ground water, River water and soil. The salinity of Ground water is found to be high. However, the water can be used for cash crops like sugarcane. The ambient air quality and sound levels are found to be well within the standards. The Krishna river water is found to be fit for Drinking after treatment.

IV. RESULT AND DISCUSION

a. Impacts on Discuss /Air Environment

During the development stage of the extend, the major exercises will include advancement of location, transport of development materials, erection of Structure, annihilation of ancient structures etc. These exercises would cause a common increment in levels of tidy and suspended particulate matter within the encompassing discuss. Amid development stage, for hardware/ fabric development trucks and trailers should be sent from manufacturer's areas. Due to the development of vehicles for transportation of development fabric required amid construction phase, negligible increment within the levels of tidy particles and hydrocarbons is conceived. In any case, this increment in concentration would be of transitory nature and localized. During development stage, suspended particulate matter will be the most toxin, which may be created from location improvement exercises and development of vehicles. Concentration of SO2, NOX and CO may somewhat increment due to expanded vehicular activity. The approach streets will be paved or tarred and vehicles will be kept in great arrange to play down the contamination due to vehicular activity. The affect of such

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 8 Issue 12, December-2019

exercises would be transitory and confined to the developed stage. The affect will be limited inside the extend boundary and is anticipated to be unimportant exterior the plant boundaries. Appropriate upkeep and support of vehicles, sprinkling of water on streets and development location, giving adequate vegetation all-around are a few of the degree that would enormously decrease the impacts amid the development phase. Atmospheric outflows emerge essentially from combustion handle (SO2, CO2, nox, particulate fly cinder,) squander water treatment (CH4), refinery operation (VOC and CO2) A moment source of particulate is criminal tidy from bagasse heaps and bagasse taking care of hardware. Fuel to be utilized within the proposed kettle is basically bagasse and biogas (H2S: 0.008%). Sulphersubstance in both fills are insignificant and hence no affect is expected due to SO2 emanation. A last source of discuss outflows is the assistant cooling tower and the related warm rise crest which contains warm and some follow materials beside the water vapor. Within the case of biogas, particulate matter is additionally not a basic parameter in any case, this is often imperative emanation parameter in case of bagasse. From fabricating handle of Sugar, SO2 may be incidentally discharged from SO2 burners, CO2 will be produced from maturation handle of refinery. VOC will be produced from Liquor dealing with & Stockpiles. Methane will be created from the treatment handle.

The Co-Gen plant will run utilizing bagasse which may be a by-product of Sugar Manufacturing plant, to create steam from tall weight tall capacity kettle and create power by utilizing condensing and extraction sort of turbine. The discuss poisons transmitted from kettle would be SPM, SO2 and nox. The kettle will be given with Pack channel to control SPM concentration in vent gasses. The tallness of chimney will be such that the ground level concentrations of poisons counting SPM, SO2 and nox due to the operation of went through wash cremation kettle will be inside the reasonable limits. The sources of discuss contamination are not having much importance as small fuel is utilized in DG sets as it were working amid crises and major control era coming from possess Steam Turbines. Emissions from vehicular development will basically emerge from the vehicles utilized for the transport of development materials and hardware, for the transport of crude materials to the location and for the transportation of wrapped up items from the location. There will be a chance that, the specialists on the location would get uncovered to this sort of outflow from the vehicles. In any case this affect will be localized and transitory in nature and will mainly influence the territories adjoining to the get to street.

b. Impact on water

Due to gracious development exercises, amid blustery season the surface run off may contain more of dissolved soil and other free matter. Development exercises will be dodged amid blustery days to relieve the little impacts on soil quality caused due to development action. With isolation of development region and legitimate drainages given anticipates the defilement of water due to soil disintegration. The plant having all around boundary and, the affect of development exercises on water environment is inconsequential. The major issue within the range is the quality of ground water, at places the water is brackish and can't be utilized for residential purposes. The concentration of nitrate and add up to hardness is much over the reasonable limits. Another major issue within the range is the expanding number of wells and bore wells. Moreover due to overabundance water system over a delayed period of time, soil saltiness has procured disturbing measurement. A add up to of 3164 hectare arrive has turned saline and another 6238 hectares is in part saline. In this way a add up to of 9402 hectares of valuable arrive asset has been saline in nature. Water is discontinuously released within the Waterway from the stores within the upstream side which is intensely utilized for water system reason coming about into drying up of the waterway. Once the waterway dries up the locale endures intense deficiency of groundwater.

c. Impacts on Soil

Due to Development Exercises & Contaminations of soil due to spillage of oil, development squander soil gets influenced. Subsequently impacts on arrive / soil will be unimportant. Affect on the soil characteristics is as a rule ascribed to wastewater. Affect due to strong squander era and fly fiery debris are too impressive. Soil quality at arrive filling location is somewhat soluble due to tall concentration of Na, Ca and Mg. Tall invasion increments soil water accessibility to the plants that's since off tall natural matter. Soil natural matter which gives numerous positive properties to soil utilized for trim generation can be hurtful when utilized too much. It can influence the soil supplements supply when it is more than 8%. In expansion tall natural matter can cause destitute drainage. Nitrogen is exceptionally valuable for plant leaf development but when it is more than tall it influences on chlorophyll action and the plant leaf gotten to be green to dark (Dead).due to the obstruction in leaf and development phosphorus gives plants with a implies of utilizing the vitality tackled by photosynthesis to drive its digestion system. But intemperate soil phosphorus levels are concern due to the potential negative affect on surface water quality. High nitrogen and phosphorous can lead to over the top plant and green growth development that corrupted drinking water quality. Tall potassium can leads to lopsidedness of base immersion level as well as tall dissolvable salts.

It is additionally create water logging within the fields. Sodium calcium and magnesium level are exceptionally tall but it is keep up the soil pH and salinity. Abundance overwhelming metal aggregation in soil is harmful to human and other creatures. When Tall concentration of aluminum ingested by plants, it ceased the osmosis and influenced root and shoot development. Most inorganic soil phosphorus is bound firmly to the surface of soil minerals (e.g., press and aluminum oxides). Warm, sodden, well-aerated soils at a pH level of almost 6.5 optimize the discharge of both of these forms. The nearness of tall concentrations of different metals in soil is due to utilize of sulfuric corrosive and urea within the refinery prepare. The refinery went through wash and dried slime contains tall concentration of different large scale supplements such as - Nitrogen, Phosphorous, Sodium, Potassium, Calcium, Magnesium, Chlorides and Sulfate

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 8 Issue 12, December-2019

straightforwardly influencing the soil quality of arrive filling site.

V. CONCLUSION

The project contains a positive reaction from the open. The readiness to pay and the eagerness to acknowledge the project has positive result. The proportion between typically around 1: 10.09. It implies the benefits are ten times more noteworthy than the misfortune. The misfortunes due to the contaminating operators are proposed to be weakened through various methods. The squanders and the contaminations can be diminishing with some measures as recommended within the report. The social and social powerlessness file reacts a really less and level of flexibility is at the higher side. The supported tall development rates and poverty reduction, be that as it may, can be realized as it were when the sources of development are extending, and an expanding share of the labor constrain is included within the development handle in an proficient way. From a inactive point a of see, development related with dynamic distributional changes will have a more noteworthy affect in lessening destitution than development which takes off dispersion unaltered. Usually in truth communicates the comprehensive development of the locale. The potential natural, social and financial impacts have been surveyed. The proposed Sugar Unit and Cogeneration Plant will have certain levels of negligible impacts on the neighborhood environment. Execution of the extend will have useful affect in terms of giving coordinate and backhanded business openings. There will be a positive socio-economic improvement within the locale. Quality of life of the individuals will be moved forward.

REFERENCES

[1] By News Paper and local issue of EIA of Kolhapur city,
[2] DSE, gom (2015), Socio-Economic Survey Report of Kolhapur District, Department of Statistics and Economic Bureau, gom.
[3] Gom (2011), Census of Kolhapur District.
[4] Jugale V. B. (2015), Irrigation Water Pricing, serials Publications, New Delhi.
[5] Jugale V. B. (1990), Irrigation and Rural Change: A case Study of Alas, Shivaji University Journal, Vol. 19, 1990.
[6] Datta Sugar, (2014-15) Annual Report.