



ENVIS nagaland



AN ENVIS NEWSLETTER

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Editorial

Having access to clean air is one of the basic necessities for a healthy life. But most of human population around the world are exposed to contaminated air accounting for millions of deaths each year. The situation is seemingly made worse each year with the increase in population, economic growth and increasing urbanization.

Studies have shown that sources which compromises air quality are plenty, ranging from industrial emissions to mismanagement of waste, poor quality of roads, vehicular emissions, agricultural activities and so on. Emissions from industrial activity which are detrimental to human health and environment are often attributed to huge industrial set ups and factories and the activities carried out within. However, significant contributors even in a non-industrial state like Nagaland are some categories within the small-scale industries sector which have been found to be increasing in number over the years. The small-scale industry sector continues to remain an integral part of Indian economy with the major advantage of the sector being its employment potential at low capital cost. In a developing economy like India, small scale industries contribute to the GDP and employment generation and may very well be described as a factor of economic growth.

While such industries are beneficial to the economy and plays a significant role in the upliftment of poor and unskilled laborers, air pollution due to the operation of small-scale industries such as stone crushing units have been found to cause serious occupational health hazards and adverse effects on vegetation and the environment in general. A large number of these industries are also set up in non-conforming areas thus causing disturbances among human settlements, vegetation and livestock.

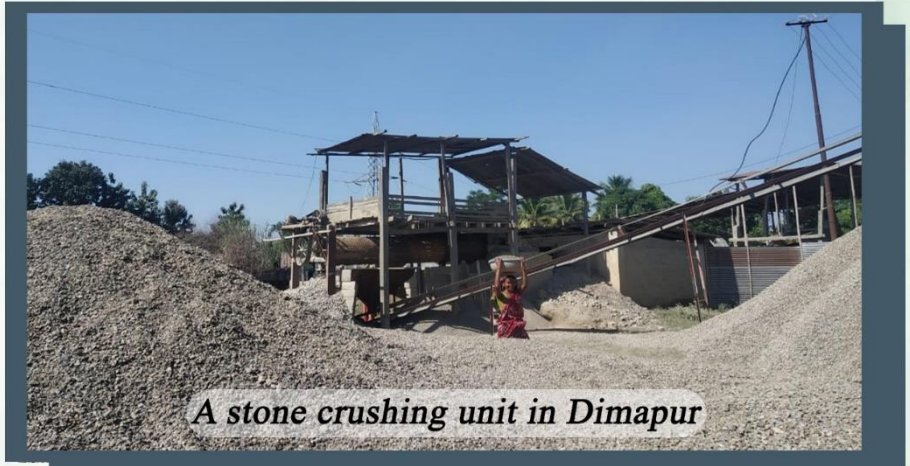
Public awareness on problems associated with such industries, finding low cost pollution abatement measures and switching from pollution control to pollution prevention measures are important steps to ensure effective control and monitoring of emissions from such set ups.

ENVIRONMENTAL PROBLEMS IN STONE CRUSHING UNITS

Stone crushers are small scale industries in the unorganized sector which provides basic material for road and building construction. It is an important industrial sector and basically involves reducing the size and form of large rocks into smaller rocks, gravel, stone chips or rock dust. The different sizes of stones depending on the requirement are then used as raw material for construction of roads, highways, bridges, buildings and so on. The number of stone crushing units in the country are expected to grow with the increasing demand for raw materials in developmental projects brought about by urbanization, industrialization and population growth.

This sector being highly labor intensive provides direct employment opportunities as a significant number of manpower is required for the various activities involved in the process such as mining, operation of the crushing unit, transportation of the final products etc. It is a source of earning for uneducated unskilled people from rural and economically

backward areas where employment opportunities are limited. It thus carries significance in terms of social and economic importance.



A stone crushing unit in Dimapur

Stone Crushing Units are mostly found to be set up in the vicinity of major towns/cities where construction activities are more compared to others. These units are also set up in clusters of a number of units and are also often located near the source of raw materials like stone mines or river beds. To avoid extra costs associated with transportation of products to the place of demand, stone crushing units are also often set up nearer to the demand centers. Supply of electricity for operation of the unit and the access of roads and highways for transportation is also another reason for these industries to be located along the periphery of main towns and cities.

While the operation of stone crushers has socio economic benefits, there are certain hazards associated with them as the processes involved in the operation of a unit results in the emission of a significant quantity of fine dust emissions which create health hazards to the workers as well as surrounding population by way of causing respiratory diseases. The dust also adversely affects visibility, reduces growth of vegetation and hampers aesthetics of the area.

Sources and Spread of Emissions

Particulate emissions are released through the different activities involved starting from quarrying to stone processing operations. These may include mining, crushing, screening, handling of the materials and transportation. Emissions are also affected by the type, quantity,

moisture content of the rock that is processed. The type of machinery involved in the process and climatic factors may also play a part in the amount of particulate emissions released from the unit.



Dust emissions from a stone crushing unit

Fugitive emissions result from mining activities involving drilling, blasting, excavation, breaking of large rocks etc and also during the process of transportation by heavy vehicles like trailers, dumpers and trucks. Particulate emission is an unavoidable outcome of the crushing operation and the emissions are higher at the feeding and discharge points. The greater the reduction in size during subsequent crushing

stages from primary, secondary to tertiary crushing, the higher the emissions. Emission of dust also occurs during the process of screening where stones are separated according to size. Although wet screening can help in minimizing the release of dust particles, dry screening is found to be more common. The screening of finer stones generates more emissions as compared to coarse ones.

As the materials are processed and move from one point to another through the use of feeders, conveyor belts etc particulate matter may be emitted from any of these handling operations. Most of the emissions occur at transfer points which includes transfers from a conveyor on to another, into a hopper or onto a storage pile. Dust is generated as the stones are made to fall through a height and also during vibratory screening. The amount of uncontrolled emissions depends on the size distribution of the material handled, the belt speed and the free fall distance.

The coarser or larger particles of dust generated settles down within the premises of the unit but a substantial percentage of finer particles of dust get carried away by wind to longer distances. However, dust that settles within the plant gets air borne again due to vehicular movement or by wind and acts as a secondary emission source. The spread of particulate matter further depends on the moisture present in the atmosphere, wind direction and speed. Other factors which effect emissions include moisture content in the rock, the type of rock processed, equipment and the practices employed in the operating unit. It is therefore, important to maintain wetness or moisture in the material during plant operations and before crushing which can be done by spraying of water.

Impact on Environment and Health

Stone crushing activities have considerable effects on the quality of the environment and human health. They mainly contribute to particulate matter in the surrounding environment and also have adverse impacts on land, air, water and the resources in the surrounding area. Particulate matter or dust have negative effects on vegetation by way of covering the leaf blades, reducing the penetration of light and blocking the opening of stomata. These obstructions in turn affects the process of photosynthesis, a crucial process required for plants to survive and thrive.

Workers are persistently and continuously exposed to large concentrations of dust and high levels of noise posing as a serious occupational hazard. It may lead to manifestation of various health problems affecting the respiratory system, hearing, eye, skin etc. Background noise and vibrations are unavoidable in such operating units and may give rise to sleeping disorders, depression, high blood pressure and temporary or permanent hearing loss. In many scenarios, the children of the workers especially female workers loiter around in the premises thus leaving the children exposed to dust and particulate matter arising out of the activities. The associated health effects are not only limited to workers within the unit but it also affects the health of communities that exist in close proximity to the unit.

Silicosis

It is a form of occupational lung disease caused by inhalation of crystalline silica dust. Silicon (Si) is the second most common element in the Earth's crust. The compound silica, also known as silicon dioxide (SiO_2), is formed from silicon and oxygen atoms. Since oxygen and silicon make up about 75% of the Earth's crust, the compound silica is quite common. It is found in many rocks, such as granite, sandstone, gneiss and slate, and in some metallic ores. Silica can also be a main component of sand. It can also be in soil, mortar, plaster, and shingles. The cutting, breaking, crushing, drilling, grinding, or abrasive blasting of these materials may produce fine to ultra-fine airborne silica dust.

Silicosis is marked by inflammation and scarring in the form of nodular lesions in the upper lobes of the lungs. A large number of quarry workers in India die a slow death due to exposure in the absence of adequate protective measures. It may also be attributed to the fact that occupational hazards are not given due attention in these unorganized sectors. There is little doubt that silicosis is a killer and the responsibility of warning workers against the risk of the disease should lie with quarry owners and contractors. Ensuring that workers get respiratory protection and that silica dust is suppressed at source through sprinkling of water or with vacuum/negative-suction pumps can help in improving the conditions of workers to a significant extent.

Measures to Control Emissions

Emissions standards have been notified under the Environment (Protection) Act 1986 in respect of suspended particulate matter to reduce/contain dust from stone crushers. In addition, the units are also required to adopt following control measures:

- Dust containment cum suppression system for the process equipment.
- Construction of wind breaking walls
- Construction of metalled roads within the premises.
- Regular cleaning and wetting of the ground within the premises.
- Growing of a green belt along the periphery of units.

Scenario in Nagaland

Air Pollution has been a cause for concern in the state of Nagaland especially in two districts; Dimapur, the commercial hub and Kohima, the capital city. Under the National Air Monitoring Programme, monitoring stations have been set up in these two districts and the air quality is regularly monitored by the State Pollution Control Board. The results thus obtained have shown that the level of Respirable Suspended Particulate Matter (RSPM) have exceeded the prescribed limits putting these two districts under the list of 122 Non-Attainment cities identified by the Central Pollution Control Board from across the country.

Nagaland, being a non-industrial state does not have any huge industries and factories which are often identified as the culprits for the bulk of pollutants in the air. However, the sources of air pollution are still numerous ranging from the poor road conditions to mismanagement and open burning of waste, vehicular emissions, construction and demolition activity, burning of fossil fuel and emissions from the small-scale industry sector etc. The stone crushing units that are found in plenty is one such category that contributes a significant amount of pollutants into the air. During the dry season there is a lot of air pollution in and around Dimapur especially with the accumulation of dust everywhere and one of the main sources of air pollution is from the Stone Crushing Units that have mushroomed around Dimapur as a result of the rapid developmental activities in recent times.

Granting Consent under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under the Hazardous Waste (Management & Handling) Rules, 1989 are some of the functions of the Nagaland Pollution Control Board. For the purpose of consent management, the industries are categorized into Special Red, Ordinary Red, Orange and Green categories, depending on the polluting nature of industry and the stone crushing units falls under the Orange category.

The Board has thus issued some guidelines for such industrial set ups to follow in order to reduce air pollution and its harmful effects on the environment and humans living in and around the unit which are as follows:

1. The Stone Crushing Units must build a Dust Retention Wall with Hessian cloth or bamboo lath frames around it so that the dust is not allowed to be blown to the adjoining areas.
2. The units must spray water to the raw material before crushing to reduce dust formation.
3. The time of operation should be as per the guidelines of the Industries recommendation which is prescribed in the license.
4. The authorities such as the Village or Colony Councils before issuing NOC should analyze properly before issuing No Objection Certificate for setting up of such polluting industries in their territory, so that health and environment are not compromised for development.
5. No amount of precaution will be enough if the unit is too close to residential areas, therefore, the best solution will be to relocate the unit if there are human settlements very close to the unit.

Awareness Programmes on Air Pollution

Kohima College, Kohima:

An awareness programme on National Clean Air Campaign was held on 26th Nov 2019 at Kohima College, Kohima with the theme “Clean Air: Life Would Be Rare Without Fresh Air” in collaboration with the Nagaland Pollution Control Board wherein students from 9 (nine) colleges of Kohima District attended. Competitions like model projects and prepared speech based on the theme were conducted for students during the programme.

Dr. Kenei Miachieo IFS, Member Secretary, Nagaland Pollution Control Board, the special guest on the occasion in his address to the students informed them of the National Air Monitoring Programme, Non-Attainment cities and also the National Clean Air Programme and was hopeful that through such awareness campaigns students would become more aware about air pollution

and spread awareness among the community. Call for Clean Air badges were also given to all participants who attended the programme.



Dr. Kenei Miachico, Member Secretary NPCB addressing the gathering



Students showcasing their project models



Distribution of Certificates



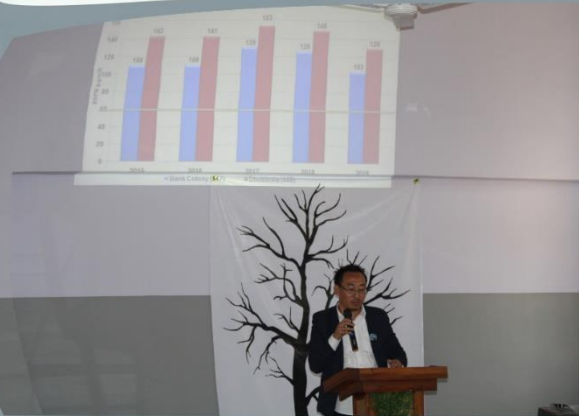
Officers of NPCB & ENVIS Hub

Vidhya Bhawan School, Dimapur

An awareness programme on air pollution was conducted by the Nagaland Pollution Control Board (NPCB) at Vidhya Bhawan Hr Sec School on February 15, 2020. The resource persons Mr. Akangmeren Imchen, Scientist B and Mr. Yanathung Kithan, Senior Scientific Assistant presented the scenario of air pollution particularly in Dimapur and Kohima and illustrated on the causes and effects of air pollution. The programme was attended by the Head of Institution, teachers and students of New Horizon School, G Mhiasiu School, Community Education Centre,

Vidhya Bhawan Hr Sec School and also officers of Nagaland Pollution Control Board and ENVIS Hub Nagaland. Altogether 1100 students and teachers attended the programme.

Before the commencement of the programme, an 'Awareness Walk' on air pollution was also initiated to sensitize the people in the locality and wherein students, teachers and officers from the Nagaland Pollution Control Board and ENVIS Hub participated in the event. A plantation drive was also conducted at the school campus and saplings were distributed to all the schools. A signature campaign was also carried out to encourage students to plant trees thus contributing in maintaining a green and healthy environment.



Mr. Yanathung Kithan, Senior Scientific Assistant, NPCB addressing the students



Students participating in the signature campaign



Officials with the Head of Institution and teachers



Students participating in the Awareness Walk on Air Pollution



GREEN SKILL DEVELOPMENT PROGRAMME ON WASTE MANAGEMENT

The GSDP Certificate Course on Waste Management (Solid Waste, Bio-Medical Waste, E-Waste, Construction & Demolition Waste) is the second GSDP Certificate Course conducted by the ENVIS hub Nagaland (Host Organization: Nagaland Pollution Control Board) and sponsored by the Ministry of Environment, Forests & Climate Change. It commenced on 2nd December 2019 and concluded on 31st January 2020. Altogether 13 trainees from different backgrounds attended the training.



In-depth theoretical classes on Waste Management were delivered by officials of Nagaland Pollution Control Board which included Mr. Akangmeren Imchen, Scientist B, Er. Aghali Swu, Environmental Engineer, Mr. Yanathung Kithan, Senior Scientific Assistant, Ms. Olivi Choppy, Scientific Assistant & Ms. Sentinaro, Scientific Assistant. Guest lectures were delivered by officers from reputed institutions and departments in the state. Mr. Puloketo Achumi, Geologist, Geological Survey of India was invited to take classes on basics and fundamentals of Geographical Information System (GIS) and use of Global Positioning System (GPS). Mr. Nyanthung Humtsoe and Ms. Niksungla from LiFE (Living For Environment), a leading NGO working in the Waste Management Sector were invited to deliver lectures on Waste Assessment Methodologies while lectures were also delivered by officers from Kohima Smart City Development Limited, Ms. Avelu Ruho, Joint CEO, Mr. Atoba Longkumer, IT Analyst and Mr. Nipukhrie Tapa, Data Officer.

The GSDP training also included visits to leading hospitals in Dimapur such as Christian Institute of Health Sciences and Research (CIHSR) and Zion Hospital & Research Centre, Material Recovery Facility at Chumukedima, Dimapur, E-circle, an e-waste collection centre at Diphupar Dimapur, FYSI group of Waste Management, 4th Mile Dimapur, Kohima Smart City Development Corporation Ltd, Solid Waste Management Facility at Lerie, Kohima, Septage Treatment Unit at Meriema, Kohima and CAAQMS NPCB Kohima so as to provide a better understanding of various environmental issues in the state as well as the processes involved in handling, treatment and disposal of different types of waste.



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