

## **Introducing Environmental Management (EM): Definition, scope and Goals of EM**

We shall require a substantially new manner of thinking if mankind is to survive. Albert Einstein

**Environmental management** is not easy to define... it can refer to a goal or vision, to attempts to steer a process, to the application of a set of tools, to a philosophical exercise seeking to establish new perspectives towards the environment and human societies, and to much more besides. Environmental managers are a diverse group of people including academics, policy-makers, non-governmental organisation (NGO) workers, company employees, civil servants and a wide range of individuals or groups who make decisions about the use of natural resources (such as fishers, farmers and pastoralists). Indeed, environmental management involves all people to some extent because all human activities ultimately have some sort of environmental impact. However, some individuals are more directly involved with resource use, and some special interest groups are particularly concerned with resource exploitation and with issues related to pollution. Environmental management therefore involves many stakeholders and requires a multidisciplinary perspective. It involves many spatial scales, ranging from the local to the global. It also involves many, diverse goals, including the desires to control the direction and pace of development, to optimise resource use, to minimise environmental degradation and to avoid environmental disaster. Environmental management may be practised by individuals and groups holding conflicting - and even directly opposing - views, as may be the case when environmental managers employed by large multinational corporations come into conflict with environmental managers representing voluntary organisations.

### **A focus on decision-making**

In general, however, environmental management is concerned with the understanding of the structure and function of the earth system, as well as of the ways in which humans relate to their environment. Environmental management is therefore concerned with the description and monitoring of environmental changes, with predicting future changes and with attempts to maximise human benefit and to minimise environmental degradation due to human activities. Yet, characteristically, environmental management is about decision-making - and it is especially concerned with the process of decision-making in relation to the use of natural resources, the pollution of habitats and the modification of ecosystems. Fundamentally, then, environmental management is a political activity because those decisions - about resources, pollution and ecosystems - are never neutral or objective; on the contrary, they are value laden and they reflect the exercise of power by particular groups over others. Moreover, in general, it is naïve to conceive of environmental management as being about simply 'the management of the environment' in the sense of humans manipulating and controlling the components and processes of the earth system. Of course, humans do exert such influences on the earth system; but it is a fallacy to think that humans 'manage', for instance, populations of humpback whales. Instead, it is more accurate to suggest that humans may be able to make some progress towards managing human impacts on humpback whales. Ultimately, then,

environmental management is more concerned with the management of human activities and their impacts than with the management of the natural environment *per se*.

### **Influencing the course of development**

Nevertheless, some types of activity are common to environmental managers. Environmental managers attempt deliberately to steer the process of development in order to take advantage of opportunities; they attempt to ensure that critical environmental limits are not exceeded; they work to reduce and mitigate environmental issues; and they are concerned with increasing the adaptability and resilience of human societies in the face of environmental change, variability, unpredictability and hazards. From this point of view, environmental management may be defined as the system that anticipates and avoids, or solves, environmental and resource conservation issues. From another point of view, environmental management may be defined as a process concerned with human-environment interactions which seeks to identify:

- what are environmentally desirable outcomes
- what are the physical, economic, social, cultural, political and technological constraints to achieving those outcomes?
- what are the most feasible options for achieving those outcomes?

Indeed, in many parts of the world (and arguably worldwide), environmental management is intimately linked with pressing issues of justice and even of survival. A further definition might suggest that environmental management is concerned with meeting and improving provision for human needs and demands on a sustainable basis with minimal damage to natural habitats and ecosystems. Thus, the concept of environmental management is closely related to another important (and problematic) concept: that of sustainable development.

Environmental management is the process of allocating natural and man-made resources so as to make optimum use of the environment in satisfying not only the present basic human needs but of the coming generations also.

This management implies an element of conscious choice from a variety of alternative proposals and furthermore that such a choice involves purposeful commitment to recognised and desired objectives.

Environmental management is not merely a management of environment but it is essentially the management of various activities with intolerable constraints imposed by the environment itself and with full consideration of ecological factors. Thus, it involves environmental planning, conservation of resources, environmental status evaluation, and environmental legislation and administration.

The focus of environmental management is on implementation, monitoring and auditing; on practice and coping with real-world issues, rather than theoretical planning. A close integration with environmental planning is desirable.

Thus, as stated earlier, environmental management is a field of study dedicated to understanding human-environment interactions and the application of science and common-sense to solving problems.

**The characteristic features of the environmental management are:**

1. It deals with a world affected by humans;
2. It supports sustainable development;
3. It demands a multidisciplinary approach;
4. It has to integrate different development viewpoints;
5. It concerns with short-term and long-term planning as well as from local to global scale; and
6. It seeks to integrate natural and social science, policy making and planning.

During the last three decades, too much awareness has been developed regarding environmental protection and quality of life. The dictionary of environment is renewed regularly with new terminologies like clean technology, environmental auditing, environment-friendly products, environmental impact assessment, environmental resource conservation, etc., added.

But all these aspects have been converged when the wider concept of environmental management has been emerged and also accepted as a tool for sustainable development. Environmental management, can also be defined as an entity that provides resources from the bioenvironmental systems of the planet but simultaneously tries to retain sanative, life-supporting ecosystems. It is therefore an attempt to harmonise and balance the various enterprises for his own benefit.

Time has now come when our policy makers as well as society should aim to protect, conserve and regulate the development in such a way that it will not create any adverse effect on ecosystem and needs of the people can also be fulfilled.

Throughout the world, particularly in developing countries, these are an urgent need for the management of the total environment.

**In the first instance environ- mental management must do three things:**

- (i) Identify goals;
- (ii) Establish whether these can be met, and
- (iii) Develop and implement means to do what it deems possible.

Thus, environmental management is an approach which integrates ecology, policy making, planning and social development.

**Its main objectives include:**

1. To prevent and solve environmental problems;
2. To establish limits;
3. To develop research institutions and monitoring systems;
4. To warn threats and identify opportunities;
5. To suggest measures for resource conservation;
6. To develop a strategy for the improvement of quality of life;
7. To suggest long-term and short-term policies for sustainable development; and
8. To identify new technology for sustainable development.

In brief, environmental management is necessary for environmental planning which implies the optimal utilisation of the earth's resources and preservation of the quality of environment for the healthy growth of society.

The term 'sustainable development' has become a matter of great concern not only to the international and national organisations but also to the policy makers.

In 1987, the World Commission on Environment and Development has published a report Our Common Future emphasising the need for sustainable development and defined it as: "Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Others refer to it as "improving the quality of human life while living within the carrying of the supporting ecosystem".

Now, sustainable development, also referred as 'eco-development', has been accepted as a concept of development by all the nations of the world.

## **ENVIRONMENTAL MANAGEMENT PLAN**

### **1. OBJECTIVE**

The objective of Environmental Management Plan (EMP) is to formulate measures which will:

1. Mitigate adverse impacts on various environmental components, which have been identified during the rapid environmental impact assessment study.
2. Protect environmental resources where possible.
3. Enhance the value of environmental components where possible.

EMP also includes a monitoring plan to enable evaluation of the success or failure of environmental management measures, and to carry out reorientation of the plan if found necessary.

It is emphasized that many of the protective and enhancement measures can be implemented by adopting suitable planning and design criteria for construction of the project.

## **2. LAND ENVIRONMENT**

### **2.1. Traffic Management**

#### **Construction Phase**

There will be no major impact on the land environment during construction phase as identified during studies. The internal roads will be designed with adequate widths to minimize traffic congestion due to the movement of trucks carrying raw materials required for construction.

Special care will be taken during transportation of construction material like cement, sand, aggregate etc. as considerable quantities of such material would be transported from various material suppliers.

The material will be sourced from the nearest available government approved contractor. Since the road transport is unavoidable, such movement will be carried out during non- peak hours as far as possible.

#### **Operation Phase**

The impact on land environment during operation phase will be due to movement of vehicles of residents and users of the hotels, commercial facilities and amenity area.

Precautions to be taken to minimize impacts on land environment will be as follows:

- Development will be as per local guidelines for Residential Development.
- Adequate measures will be taken considering the natural drains by incorporating design elements like steep land landscaping etc.
- There will be minimum amount of cut and fill to reduce disturbance to the existing surface water hydrology
- Natural drain lines which fall in the path of proposed roads will be maintained as far as possible through construction of culverts.
- Adequate provisions will be made through provision of internal roads of minimum 9m width for smooth vehicle entry and exit.
- Approach road (external road) and internal roads for onsite traffic movement will be planned as per project development.

### **2.2. Solid Waste Management**

The salient features of the proposed solid waste management strategy are as follows:

- For waste generated during the construction phase, gross segregation of waste into roadwork materials, structural building material and salvaged building parts will be made. Additional segregation to facilitate reuse/ recycling will be made.
- Material wastes like bricks, cement etc. will be used as fill material and concrete will be recycled and reused at the site.
- Adequate facilities for the storage of these waste materials would be made on site.
- Management of solid waste generated during the operation phase would include collection, transportation and disposal in a manner so as to cause minimal environmental impact.
- It will be made mandatory for waste to be segregated right at the source of waste generation. Collection of segregated waste would be made from the residential areas, resorts, hotels and commercial and amenity areas.

- There would be manual collection & storage of biodegradable waste at the ground level; and Reusable and recyclable waste would be manually collected and stored in closed rooms at ambient temperatures.
- Biodegradable waste from residential buildings, commercial blocks would be transferred to mechanical composting units within the site for disposal. Compost from the same will be used for landscaping.
- Reusable and recyclable waste will be disposed by selling to scrap dealers and private contractor for resale.
- Non-degradable waste will be transferred to municipal solid waste management system.

### **3. AIR POLLUTION**

#### **3.1. Construction Phase**

##### **a) Mobile source emissions**

1. Transportation of raw materials required for construction will be carried out during non-peak hours.
2. Idling of delivery trucks or other equipment will not be permitted during unloading or when not in active use.
3. To minimize dust emissions due to trucks carrying cement, gravel, sand to site, ready mix concrete carried in enclosed container will be used which is a better option as compared to on site batch mixing.
4. Dust covers will be provided on trucks used for transportation of materials prone to fugitive dust emissions.
5. Covering scaffolding and cleaning of vehicles which can reduce dust and vapor emissions will be used.

##### **b) Stationary source emissions**

1. Most of the machinery related to construction will be located close to construction area for ease of handling.
2. Machinery such as conveyers and mixers will be screened with sheets of suitable material to reduce transport of suspended particulate matter and noise.
3. All stationary construction equipment will be located as far away as possible from sensitive receptor locations in order to allow maximum dispersion of emitted pollutants.
4. Areas prone to fugitive dust emissions due to activities such as excavation, grading sites and routes of delivery vehicles across patches of exposed earth, will be frequently water sprinkled to prevent re-entrainment of dust.
5. Hosing down road surfaces especially if they are unfinished surfaces also helps to prevent fugitive dust emissions.
6. Other measures include appropriate containment around bulk storage tanks and materials stores to prevent spillages entering watercourses.
7. Apart from these, equipment/ machines and vehicles will be always kept in good state of repair to minimize emissions. Construction areas will be enclosed, wherever possible.

### **3.2. Operation Phase**

1. Plantation along the roadside helps to reduce effects of air/ noise pollution. A row of trees will be planted along the plot periphery to screen the site from air/ noise pollution.
2. Regular maintenance and upkeep of the internal road within project will ensure smooth traffic flow and will help to reduce air pollution.
3. As per the project analysis, the impact of proposed project would be positive when proper traffic flow is maintained. The entrance/ exit to the site will be maintained so that there are no obstructions to traffic flow as also road side parking will be avoided.

## **4. NOISE POLLUTION**

### **4.1. Construction Phase**

1. Construction contract specifications will specify use of equipment generating noise of not greater than 90 dB (A).
2. Contract specifications for construction will stipulate levels of maximum noise generation in various zones based on CPCB Noise Standards.
3. High noise generating construction activities like, compacting etc. will be carried out only during day time.
4. Workers working near high noise construction machinery will be provided with ear muffs/ ear plugs.
5. Provision of temporary barricading around site.

### **4.2. Operation Phase**

During operation phase it is important to maintain the noise levels within the plot for the safety and better health of residents and users. The various precautions to be taken to maintain acceptable noise level within the project area are as under:

1. Buffer in form of wall or tree plantation will be provided along the main roads
2. Green belt would be essential adjacent to sensitive locations like reserve forest areas, lakes etc.
3. Smooth flow of traffic will be ensured on the internal road to avoid idling of vehicles.

## **5. WATER ENVIRONMENT**

### **5.1. Construction Phase**

1. Construction area will be isolated and care will be taken to divert the run-off to storm water drainage, so possibility of pollution from construction run-off is prevented. Also, subsurface work will be carried out only during non-monsoon period.
2. Precaution will be taken to ascertain that no waste material like cement, paint and solid material like iron rods and any other material is dumped into storm water system.
3. No accumulation of stagnant water will be allowed to prevent breeding of mosquitoes.

## **5.2. Operation Phase**

1. Adequate measures will be taken considering the natural drains by incorporating landscape design elements like steep land landscaping etc.
2. A well engineered storm water drainage system will be provided as a part of this development.
3. A well designed rain water harvesting system will be implemented as a part of the project. The harvested water will be utilized.
4. The daily water requirement would be met from MCGM. After the analysis of the site, it is recommended that the project proponent installs scientifically designed rain water harvesting system and sewage treatment plants with facilities to recycle sewage to reduce load on natural water sources.
5. Existing natural drainage lines on site will be maintained as far as possible.

## **6. GUIDELINES FOR BIO-AESTHETIC MANAGEMENT**

### **6.1. Protection of trees on site**

Protection of existing trees within the plot which would not be affected by the proposed layout will be the first priority during construction. The precautions to be taken are as under:

1. The detailed design of the proposed development will be in accordance with the Development Control Regulations. Care will be taken to maintain the form such that the aesthetics of the region is maintained and the skyline is not modified.
2. Precaution would be taken while transporting construction material to the site to prevent accidental damage or spillage.
3. The work force will be briefed about importance of preserving and protection of exiting trees before starting the construction work.
4. Trees propagation/ plantation will be initiated by project proponent from project initiation stage for better results.
5. Specifically, large and healthy trees will be given maximum weight age in tree protection than giving importance to merely the number of trees, as is not possible to avail such full grown and mature trees in short span of time with any efforts and cost.
6. The existing trees will be removed only when it is a must and all other options are thoroughly considered and exhausted.
7. Proposed green belt will consist of trees planted at the rate as specified in the Policy. The trees would be the fruit bearing type and native species suiting the local climate as far as possible.

It is recommended that tall trees will be planted to form an avenue along roads and to buffer the vehicular noise and dense canopy trees will be planted on the periphery of the plot to form a screen to reduce impact of air/ noise pollution.

## **7. SOCIO-ECONOMIC ENVIRONMENT**

Basic infrastructure facilities like water supply, sanitation, drainage etc. will be provided as part of the proposed project. Villages existing within the project demarcation area will be kept untouched and care

would be taken to cause minimum disturbance to these sites. Thus, there would not be any adverse impact on local population; rather the settlements in the vicinity of the proposed project would be benefited because of the facilities provided by project construction. Public health & safety will be the priority of the project.

### **7.1. Construction Phase**

The health and safety of the workers for the construction project will be ensured by:

1. Proper instructions about personnel safety will be given to all the labour working on the site by project manager before commencement of work.
2. The labourers will also be guided about the measures to be taken during emergency and accident like fire etc.
3. Safety equipment like gloves, helmet, mufflers etc. which will be made mandatory to use for all labourers on site.
4. Proper sanitation and water supply facilities will be provided to the labourers during construction phase.
5. Insurance cover will be provided to the workers working at site.

### **7.2. Operation Phase**

During operation phase, precautions will be taken to ensure the health and safety of the local residents and the users. Fire fighting system comprising of smoke detectors and well designed hydrants will be

provided in each building. Fire water tanks with storage capacity as recommended will be provided. Maintenance of the systems will be carried out regularly to ensure proper functioning during emergencies. Periodic inspection and maintenance of all water storage tanks will be carried out at regular intervals to prevent outbreak of waterborne diseases.

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