

7. Environmental Challenges and Agenda for Action

7.1 Premise

A sustainable community uses its resources to meet current needs while ensuring that adequate resources are available for future generations. It seeks improved public health and a better quality of life for all its residents by limiting waste, preventing pollution, maximizing conservation, promoting efficiency, and developing local resources to revitalize the local economy.

"Sustainable communities are defined as towns and cities that have taken steps to remain healthy over the long term. Sustainable communities have a strong sense of place. They have a vision that is embraced and actively promoted by all of the key sectors of society, including businesses, disadvantaged groups, environmentalists, civic associations, government agencies, and religious organizations. They are places that build on their assets and dare to be innovative. These communities value healthy ecosystems, use resources efficiently, and actively seek to retain and enhance a locally based economy. There is a pervasive volunteer spirit that is rewarded by concrete results. Partnerships between and among government, the business sector, and non-profit organizations are common. Public debate in these communities is engaging, inclusive, and constructive. Unlike traditional community development approaches, sustainability strategies emphasize: the whole community (instead of just disadvantaged neighbourhoods); ecosystem protection; meaningful and broad-based citizen participation; and economic self-reliance." (Institute for Sustainable Communities: <http://www.iscvt.org>)

The review of history of environmental management world

over provides following as the basis for devising environmental action plans for metropolitan areas:

- ✓ Monitoring is a fundamental aspect of environmental management at both policy and programme levels;
- ✓ Public consultation and participation is an essential element of environmental management. The people affected by a policy or programme have the right to know, to understand the benefits and disadvantages, and to express their views on the environmental change the policy and programme may bring;
- ✓ Education is a fundamental component of environmental management;
- ✓ Development and environmental quality are indivisible and should be pursued as common objectives;
- ✓ Equity between generations, the concept that ecosystem productivity and environmental quality must be passed on, are fundamental premises of environmental management;
- ✓ The central and undeviating objective of environmental management must be the preservation of the ecosystems upon which all life depends; and
- ✓ Environmental management is as much about restoration as management.

7.2 Agenda for Action

With the backdrop of present state of environment, environmental challenges (🌍) and globally evolving thinking on environmental management agenda for action (📄) for NMMC are discussed herein.

7.2.1 Reduction of Noise Pollution Challenge



Noise pollution is a serious threat to the quality of environment. Noise is over-loud or disturbing sound. Sound levels are measured in decibels (dB). It is a unit for expressing the relative intensity of sound. Noise pollution may come from loudspeakers, factories, and aeroplanes, moving trains, construction activity or even a radio. Noise level of 80 decibels or more for more than 8 hours a day increases tension and changes in breathing patterns. Continued exposure to high levels of noise results in fatigue, hearing loss or even total loss of hearing, changes in blood circulation, changes in breathing, etc. Noise pollution above 120 decibels can cause many adverse biochemical changes. Cholesterol levels in the blood and white cell counts increase, besides causing hypertension. In NMMC area noise levels at traffic junctions are very high. In CBD Belapur noise levels as high as 90 dB were recorded. Even in residential areas, high noise levels were recorded in Vashi, Turbhe, Airoli and Digha areas. With increase in traffic, noise levels would increase in future.

Agenda for Action



- ⇒ *Planting trees with high foliage density along roads to reduce impact of noise could be undertaken;*
- ⇒ *Avoiding/minimizing use of loud speakers, which have become a part of festivals, weddings and prayers;*
- ⇒ *Writing slogans for education of public regarding impacts of noise on health;*
- ⇒ *Installing decibel metres for monitoring noise levels along highway and other major roads, and also near sensitive localities like schools and hospitals;*

- ⇒ *Declaring more silence zones; and*
- ⇒ *Banning blowing of horns, especially at traffic junctions.*

7.2.2 Solid Waste Management



Challenge

Solid waste continues to receive a great deal of media attention as the available space to dispose of household garbage and municipal solid waste gets exhausted. Disposal of solid waste on land contaminates ground water, soil, surface water, and air. Technological solutions comprise use of liners and Leachate treatment systems to prevent environmental degradation. In Navi Mumbai, landfill space is at a premium and hence, solid waste management is a major challenge.



Agenda for Action

- ⇒ *Promoting waste segregation at source (compostable / non-compostable, glass, plastic, paper etc);*
- ⇒ *Increasing public awareness and education for waste minimization in purchasing, use and disposal of consumer products. Such campaigns may highlight use of simple solutions such as purchasing goods with less packaging, maintaining and repairing household appliances, and carrying reusable shopping bags instead of plastic bags;*
- ⇒ *Composting and/or biomethanation of solid waste (solid waste in*

Navi Mumbai contains over 35 % organic wastes); and

- ⇒ Providing technical support for installation of vermi-composting plants at housing complexes/society level. Involving school children in such programmes.

operational facilities with pollution control facilities.

- ⇒ Abandoned quarries can be restored by sanitary land filling with innocuous inorganic wastes, especially construction debris by adopting suitable slopes from stability angle and with due compaction.

7.2.3 Restoration of Stone Quarries and Protection of Hills



Challenge

Gravel and stone quarry operations result in extensive manipulation of the landscape and of the ecosystems indigenous to their sites. Quarrying results in conditions favourable for accelerated erosion because the topsoil environment required for establishment of stabilizing vegetation is eliminated. Once quarry resources are exhausted or operations cease, the landscape has often been degraded to an extent that recolonization by pre-disturbance communities is difficult, if not impossible. Such degraded lands lead to safety, ecology, and aesthetics-related concerns. The intrinsic legacy of quarrying is the exposure of bare soil and underlying strata which vary in stability, do not support vegetation, and which contrast sharply with adjacent undisturbed landscape features. There are over 200 quarries in NMMC area (Nerul 106, Turbhe 92, Koparkhairane 8, Digha 3). In view of land degradation due to stone quarrying in NMMC, restoration of these areas is a challenge for NMMC.



Agenda for Action

- ⇒ Assessing feasibility of using abandoned quarries for rainwater harvesting;
- ⇒ Planting trees for restoration of land under abandoned quarries
- ⇒ Quarries in operation to implement better handling

7.2.4 Protection of Coastal Areas



Challenge

The coast is the interface between the land and sea. The beaches and inter-tidal zones are areas where the transition from land to sea, or sea to land takes place. Coastal zones are among the richest and biologically most productive areas. Mangroves found in coastal areas play a crucial role in the marine ecosystem. The major ecological role of mangroves is the stabilization of the shoreline and prevention of shore erosion. The dense network of prop roots, pneumatophores and stilt roots not only give mechanical support to the plant, but also trap the sediments. The rate of sedimentation is generally much higher in these estuaries lined with mangroves.

The second important ecological role of the mangroves is the detritus, which help in feeding and providing breeding and nursery grounds for the juveniles of many commercially important shrimps and fishes. Major primary production in the mangrove ecosystem is from the trees. However, only a fraction of this production is consumed by herbivores. The remainder enters the mangrove water as litter fall. The decomposition of this litter fall produces detritus, which in turn is colonized by heterotrophic microorganisms, thus enhancing its nutritive value. The detritus, besides forming a food source for suspension and deposit feeders, is also consumed by the juveniles of a variety of bivalves, shrimps and fishes, which migrate into the mangrove environments in their life cycle for better feeding and

protection. There is a direct correlation between the extent of mangrove forests along a coastline and the fishery as well as shrimp catches from the coastal waters adjoining the mangroves, thus demonstrating the importance of mangroves for sustaining coastal fisheries. The length of coastline in NMMC is over 23 km. There are excellent mangrove areas along the coastline particularly near Palm Beach Marg, Nerul, Koparkhairne areas and these face threat of removal due to disposal of waste and also abuse of land for unauthorised uses by fishermen and builders. Mangrove area is about approximately 50,000 sq.m including mud flats.

Agenda for Action

- ⇒ Forming watch committee with participation of experts as also people staying along coastline to monitor strict enforcement of Coastal Regulation Zone (CRZ) notification issued by the Government of India, Ministry of Environment and Forests (MoEF); and
- ⇒ Drawing attention of the State Level Coastal Management Authority to offences committed in violation of legal provisions .

7.2.5 Water Conservation



Challenge

The nation's ground water resources are extremely valuable. Even more than surface waters, ground water resources are often taken for granted because they are not visible. Rainfall and surface water which had seeped into the earth's crust over many years formed underground reservoirs. The apparent abundance of water is deceptive and we tend to take it for granted. We tend to abuse and overuse it. This leads to water scarcity, for which the reasons are:

- ⇒ Increasing demand for water due to rapid increase in population;
- ⇒ Poor recharge of ground water resources due to deforestation and overgrazing which result in soil erosion and inability of the soil to permit water infiltration; and
- ⇒ Siltation of bodies of water due to denudation of the vegetational cover in the hills and catchment areas.

NMMC does not have water supply source of its own. NMMC purchases water from MIDC and MJP. Hence, conservation of water in NMMC area assumes very high importance.

Agenda for Action

- ⇒ Educating citizens to emphasize that water should not be wasted, leaky taps must be repaired and taps closed when not in use;
- ⇒ Encouraging collection and storage of rain water for domestic non-consumptive purposes;
- ⇒ Leak detection and preventive maintenance of water distribution systems;
- ⇒ Maintenance of overhead storage tanks in good condition;
- ⇒ Desiltation of tanks regularly during the summer months;
- ⇒ Afforestation of barren, hilly slopes on a warfooting;
- ⇒ Terrace cultivation of hilly slopes to prevent water run-off;
- ⇒ Contour ploughing and planting of grasses and trees to check run-off water and increase the soil's capacity to retain moisture;
- ⇒ Harvesting rainwater using recharge pits, recharge

trenches, abandoned dug wells, abandoned hand pumps, recharge wells, recharge shafts, percolation ponds, check dams, nalla bunds, as also roof top rainwater harvesting.

7.2.6 Water Quality Management



Challenge

Like clean air, fresh water is also becoming a scarcity in most of the urban areas. Major sources of water pollution are domestic sewage and industrial effluents. Human excreta contains 400 different species of bacteria and viruses. Even well-treated sewage contains pathogenic bacteria and virus, unless properly chlorinated before discharging into any water course. Sewage is a major contributor to water-borne diseases and affects the health of people and other organisms in the environment in many ways. Industrial effluents add large amount of organic wastes and toxic pollutants to water bodies. Most of surface water bodies in NMMC area are already highly polluted. Improvement of surface water quality is a significant challenge to NMMC.

Water in which maximum permissible concentration of any single or more constituents is in excess is unfit for drinking and human health. There are definite tolerance levels for water used for different activities such as drinking, bathing, irrigation and industrial purposes. Depending on its use, there are different physico-chemical and bacteriological standards for water. About 10 % drinking water samples in year, with more percentage in summer months, in some parts of NMMC, do not conform to drinking water standards. This results in higher level of mortality, loss of mandays, and also may lead to epidemics. Improvement of drinking water quality and education of public for reduction of water borne diseases is a challenge to NMMC.



Agenda for Action

- ⇒ Augmenting and/or modifying sewage treatment plants;
- ⇒ Improving operation and maintenance as also performance monitoring of STPS;
- ⇒ Co-ordinating with Maharashtra Pollution Control Board for control of industrial effluents;
- ⇒ Diverting wastewater entering surface water bodies without treatment to the STPs;
- ⇒ Assessing adequacy of chlorination systems and improving the same wherever necessary; installation of additional chlorinators and
- ⇒ Undertaking campaign to advise citizens on practising use of household water purification measures such as use of clean vessels to store water, filtration of water through a clean, white cloth before storing, use of inexpensive traditional 3-pot filters, boiling of water before drinking, and if possible use of modern water filtering equipment capable of removing bacteria.

7.2.7 Hazardous Waste Management



Challenge

Sophisticated technologies produce consumer goods ranging from cars to paints. Many of these processes generate hazardous wastes of one sort or another. Hazardous wastes have characteristics that make them potentially dangerous. Hazardous wastes include wastes that contain chemicals which are corrosive, flammable, reactive, or toxic.

Hazardous wastes may be by-products of manufacturing processes or discarded products, such as household cleaning fluids, paints, and batteries. Once generated, hazardous wastes require proper storage, treatment, and disposal. Currently operating industries that produce hazardous wastes are regulated by the provisions of the Hazardous Waste Rules, 1989, of the Ministry of Environment and Forests. One of the requirements of these rules is the cradle-to-grave reporting system that tracks hazardous wastes from the factory through transportation, treatment, and disposal. NMMC is not directly responsible for hazardous waste management. However, indiscriminate storage, transport and /or disposal of hazardous waste would pose threat to residents of NMMC area. Hence, NMMC needs to look in to hazardous waste management issue.

Agenda for Action

- ⇒ Encouraging common hazardous waste management facilities for industries located in Navi Mumbai;
- ⇒ Encouraging industries to adopt better manufacturing processes, train workers to reduce quantities of hazardous waste generation, and substitute hazardous ingredients with non-hazardous or less hazardous ingredients; and
- ⇒ Playing a catalytic role in organising seminars, workshops and training programmes for industrial waste minimisation.

7.2.8 Restoration and Beautification of Lakes



Challenge

Aquatic ecosystems perform numerous valuable environmental functions such as recycling of nutrients, purify water, recharge ground water, augment and maintain stream flow, and provide habitat for wide variety of flora and fauna and recreation for people. Various anthropogenic activities alter the physical, chemical and biological processes within aquatic ecosystems. Restoration means returning an ecosystem to a close approximation of its condition prior to disturbance. This ensures that the ecosystem structure and function are recreated or restored, and that natural dynamic ecosystem processes operate effectively again. The most widespread problems facing lakes is hydrologic and physical changes and siltation from catchment activities resulting in spatial decline. There are 37 lakes in NMMC area. These lakes need restoration and beautification for maintenance of aquatic ecology and improving quality of environment.

Agenda for Action

- ⇒ Identifying sources of pollution of the lakes;
- ⇒ Restoring physical, chemical and biological integrity of lakes by controlling nonpoint source of pollution;
- ⇒ Desiltation of lakes;
- ⇒ Development of plans for watershed restoration through collaboration among scientists, economists, managers, policy makers and local people;
- ⇒ Restoration of all types of habitats with priority to the habitats of endangered species; and
- ⇒ Beautification of lakes with involvement of private sector.

7.2.9 Promotion of Use of Renewable Energy



Challenge

In the past century, it has been seen that the consumption of non-renewable sources of energy has caused more environmental damage than any other human activity. Electricity generated from fossil fuels such as coal and crude oil has led to high concentrations of harmful gases in the atmosphere. This has in turn led to many problems being faced today such as ozone depletion and global warming. Hence, alternative sources of energy have become very important and relevant to today's world. These sources, such as the sun and wind, can never be exhausted and therefore are called renewable. They cause less emission and are available locally. Their use can, to a large extent, reduce chemical, radioactive, and thermal pollution. They stand out as a viable source of clean and limitless energy. These are also known as non-conventional sources of energy. Most of the renewable sources of energy are fairly non-polluting and considered clean though biomass, a renewable source, is a major polluter indoors.

A host of fiscal incentives and facilities are available to both manufacturers and users of renewable energy systems, which include:

- ✓ 100% accelerated depreciation for tax purposes in the first year of the installation of projects/systems;
- ✓ No excise duty on manufacture of most of the finished products. Low import tariffs for capital equipment and most of the materials and components;
- ✓ Soft loans to manufacturers and users for commercial and near commercial technologies;

- ✓ Financial Incentives/Subsidies for devices with high initial cost;
- ✓ Encouragement to NGOs and small entrepreneurs; and
- ✓ Allotment of land on long term basis at token lease rent and supply of garbage free of cost at project site by State Governments, in respect of projects on energy recovery from municipal waste.

NMMC is not generator of power. However, NMMC can contribute to reduction in power demand from conventional sources of energy.

Agenda for Action

- ⇒ Conducting energy audit of NMMC buildings;
- ⇒ Installation of solar water heaters for government buildings;
- ⇒ Installation of photovoltaic systems for garden and street lighting;
- ⇒ Replacement of incandescent lamps with compact fluorescent lamps in government buildings;
- ⇒ Providing technical guidance for energy conserving building design;
- ⇒ Encouraging industries to undertake energy audits; and
- ⇒ Undertaking energy conservation awareness campaigns especially at schools.

7.2.10 Pollution Prevention in NMMC Area



Challenge

One of the most encouraging environmental development of recent years is the trend toward preventing -- and not just treating -- pollution. Pollution prevention involves waste minimisation -- recycling what we used to throw away or not generating wastes in the first place. Many companies now are cleaning up solvents for re-use or changing the industrial process to more efficiently use raw materials. Likewise, scientists are developing new technologies every year to eliminate or greatly reduce our dependence on toxic substances. The same basic pollution prevention ideas can be used in the home. Pollution

prevention requires bringing out change in attitude towards life. It requires participation of regulatory agencies, industries, consumers, and even housewives. Promotion pollution prevention (P3) in NMMC area can be a broader goal for NMMC.

Agenda for Action

- ⇒ Conducting audit of NMMC departments for identifying opportunities of pollution prevention;
- ⇒ Encouraging industries to adopt pollution prevention technologies;
- ⇒ Encouraging local colleges and institutions for organising awareness campaigns for pollution prevention.