

Urgent Environmental Problem in Vietnam for Which Could EM Technology Be Used

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Environment represents a matter of epochal characteristic. The management, protection and improvement of environment and the development of favourable environmental conditions for the mankind's livelihood and development constitute important activities of the human society nowadays.

Since the past ten years ago there has been a growing concern for environmental protection activities in Vietnam. The Law on Environmental Protection of Vietnam has come into effect since 10 January 1991.

At present different positive measures are taken to solve urgent environmental problems, of which the option of appropriate technological measures to be introduced into production for avoiding environmental damage .

1. Actual environmental situation of Vietnam

Being a country located in a tropical region with special geographic position, Vietnam is endowed with advantageous resources and environmental conditions for designing its development strategy. But, right in its initial steps in economic development, Vietnam has been facing with serious environmental problems. Natural resources are degraded quantitatively and qualitatively. Forests are in danger of devastation in many localities. The irrational exploitation and utilization of lands are resulting in the loss and pollution of lands. Maritime resources, especially biological resources, coral reefs, mangrove forests are on the decline; maritime environment begins to be polluted because of the development of transport, oil exploitation and other activities, Mineral resources, water resources, biological resources and ecological systems are unreasonably used and tend to scarcity and exhaustion, Air, water and soil have been polluted. Urban and rural ecological environment becomes complicated and the complicacy is serious in some circumstances, In addition, the consequences of wars, especially the bad effects of chemical toxins, have produced and continue to produce dramatic influences on natural environment and ecological conditions. The quick demographic growth and the irregular distribution of labour force constitute also complicated factors in the population-environment relationship. The following facts and figures show us urgent environmental problems to be solved in our country.

Land degradation and soil pollution

According to the results of last surveys and evaluation over 1.3million ha of hills and mountains have become bare lands, of which approximately 1.2million ha are dramatically eroded, rocky and become unproductive. These phenomena may be seen concentratedly in the northern hilly and mountainous regions and the central coastal areas. The qualitative decline of soil occurs in many places due to different causes such as the leaching and erosion resulted from heavy rains, the irrational, and abusive application of fertilizers.... In the vicinity of industrial factories, soils are polluted due to the accumulation of heavy metals.

Degradation of forests

According to the latest statistics, there remain in the whole country 8,631,000 ha of forests, this means nearly 6million ha of forests have been lost since 50 years ago. The forestry coverage is only 26.05% by now, even less, for example 9.8% in Son La province. There exist only 384,000 ha of rich forests, accounting for 9.29%, among 4,168,000 ha of broad-leaved forests.

Degradation of superficial water

The destruction of forests and the liquid waste discharged from industry, agriculture, transport and communications and living quarters lead to the pollution of superficial water which is mixed with sand, mud, chemicals, oil, metals, bacterial pathogens. The quality of water is deteriorated, hampering the growth and development of aquatic creatures, and this kind of water is not usable for people's life. This is a big danger to socio-economic development.

Degradation of underground water

The quantitative and qualitative diminution of underground water is resulted from the excessive and technically inappropriate exploitation of this valuable natural resource. In some water wells which have been drilled since less than 10 years now, the water level lowers some tens of meters and the water delivery decreases by 30-70%. Underground water is also polluted by different sources of water, especially the infiltration of salts is a threat of water deficiency in many localities. In hilly and mountainous regions, pollution is not yet a worrying problem, but a growing tendency is that the water reserve decreases and water level gets down due to the devastation of forests.

Air degradation and pollution

Surveys show that air in urban areas and industrial zones is dramatically polluted, exerting bad influence upon the people's health. The concentration of dust in coal mines, rock grinding factories, sand screening grounds, fire-brick enterprises.... is 5-1,000 times higher than tolerance. Over 50 types of commonly used toxic chemicals such as Pb, N₆H₆, SO₂, CO₂, ClO..., are often above tolerance. Many outdated factories have no equipment for treating waste. Chemicals used in agriculture, especially insecticides, pesticides and herbicides fogged in the height with high toxin concentration, have bad influence on the users and the environment.

The development of traffic, transport and communications and construction in many areas has resulted in air pollution which is very serious in some circumstance, especially in cases of the presence of CO, NO₂, SO₂, Pb, and derivatives of Pb, and in the high percentage of people infected with respiratory system diseases such as tuberculosis, bronchitis, pulmonary cancer, cough, asthma. The corrosion and destruction of equipment, instruments and construction materials will certainly lead to costly repair and rehabilitation.

Degradation and pollution of maritime environment

The quality of sea water in Vietnam coastal areas has begun to be degraded; its content of Cu, P, Cd... is from 2 to 4.2 times higher than allowable standard. The content of oil in some areas, for instance in Hai Phong seaside, is 10 times higher than tolerance; it is all the same in Vung Tau and Ho Chi Minh city sea coast. The contamination of pathogens such as coliform in a lot of areas reaches 24,000/100mg of sea water. In addition, solid waster discharged from the mainland aggravate also the pollution of maritime environment.

Maritime resources, especially aquatic products, have been diminished in consequence of maritime degradation and pollution; even some fish species, such as abalone in Cat Ba and Bach Long Vi islands, are in danger of exhaustion and extinction.

Degradation of biodiversity

The degradation of forestry and maritime environment has resulted in the restriction of home of wild plants and animals; many species have been exterminated and are in danger of extermination such as trunky hog, rhinoceros, wild ox.... The trading of meat of wild beasts, alive birds and beasts and taxidermy animals has not yet been strictly controlled.

Environmental degradation and pollution in urban areas and industrial zones

According to statistic data, the speed of urbanisation with its growth in land area and population matches with the increase of solid and liquid wastes, the growth of water and energy consumption, the development of motorized means of transport and communications, and the decrease of verdure and water surface. Many factories and enterprises originally built up in a former suburban area are now surrounded by densely populated quarters. A hard nut to crack is that the environmental pollution caused by wastes of all kinds emitted from all socio-economic activities is exerting bad influence on the health of urban communities. The urbanization occurs rapidly on the basis of the old cities and towns where obsolete infrastructures become now inappropriate, creating numerous difficulties in the management of urban environment. Parallely with the fast and widespread utilization of oil fuelling motorized vehicles, air in urban areas and industrial zones becomes seriously polluted catastrophes of land, water and air in these centers are now uncontrollable, Ha Noi city and Ho Chi Minh city may be used as good examples for illustration:

-Hanoi city: The concentration of SO_2 and CO_2 is 14 times and 2.2 times above tolerance respectively. Dust in Ha Noi proper is 5-10 times higher than in the outskirts. The concentration of suspensoids in water in some areas is often many times higher than tolerance. In the sections of rivers within Ha Noi city territory, fetidness emanates from water, in which the density of Pb, Hg, Cr... is very high, and the content of BOD_5 , NO_2 , NH_4 ... is much higher than tolerance, in addition to the contamination of pathogenic bacteria causing ophthalmic, digestive, gynecoid.... diseases. Land is also polluted by gas solid and liquid wastes, chemical fertilizers, insecticides and excrements.

-Ho Chi Minh city: Land, water and air are seriously polluted by solid, liquid and gas wastes emitted by 700 industrial factories and 30,000 handicraft enterprises in addition to wastes without any treatment before the discharge from living quarters of 4 million inhabitants. The content of BOD_5 in water of canals is 120-210 mg/L. Land around production enterprises contains such heavy metals as Pb, Cr, Hg... with a density 20 times higher than tolerance. Air is polluted with dust of which the concentration is even 70 times higher than tolerance, whereas the concentration of SO_2 , CO_2 , NO is 6 times above tolerance,

Environmental degradation and pollution in rural area

An urgent problem is the quick demographic growth which results in the continual diminution of land per capita, the excessive exploitation of land resources, the qualitative degradation of land due the abuse of chemical fertilizers, and the quantitative decrease due to the shift of land from agricultural production to dwelling, road and irrigation construction. The demographic growth exerts a pressure on forests: forestry land is shifted to agricultural land, and consequently aggravates environmental degradation.

Problems to be urgently solved are the lack of clean water, the pollution of water (water is contaminated with pathogenic bacteria and parasitical worms... causing different diseases), the residuary chemical toxins in food agro-products (high nitrogenous content in vegetables detrimental to people's health), the abuse of chemicals in agriculture harmful to the biodiversity (a lot of species of birds, fish, shrimps, amphibians have been decreased, even extincted).

Labour environmental pollution

Major pollutants harmful to labourers including dust, toxic gas, noise, high temperature and moisture, inappropriate light... have resulted in the infection of occupational diseases of workers in different sectors. The percentage of workers infected with respiratory, cardiovascular, endocrinal, mental... diseases in the sectors of construction materials, chemistry and metallurgy are 55%, 61% and 66% respectively. In Thai Nguyen iron-steel industrial zone,

among 262 workers having contact with silica, 56 have been infected with diseases and 39 begin to be infected. 88% of workers of coal mines are infected with otolaryngologic diseases. 85% of workers in industrial factories have diseased lung due to dust.... Surveys have showed that the workers' health is deranged by numerous factors, e.g. in the metallurgy sector, 22% workers have contact with 6 kinds of toxins, 14.8% with 7 kinds of toxins and 3.5% with 8 kinds of toxins.

Environmental catastrophes

Besides such natural calamities as storm, inundation, drought, cyclone, heavy rain..., it occurs also artificial environmental catastrophes, e.g. the collapse of mines, the forest fires, the deposition of acids... which result in noticeable loss in different regions. Especially in some recent years, the leakage of oil often occurred on the rivers and the sea, causing much troubles, markedly the oil leakage in Cat lai, Ho Chi Minh city.

2. Main objectives of environmental protection activities of Vietnam in the forthcoming period

It is obvious that Vietnam is facing with much severe challenges in stepping into the new development epoch. Industrialization and modernization of the country are indispensable to achieve the huge goals of socio-economic development and catch up with other countries in the region as soon as possible. But international experience in environmental management shows that the fast economic growth often leads to exhaustion of natural resources, environmental degradation and ecological destruction which are at last detrimental to the sustainable development.

To prevent this disastrous consequence, two most important points in environmental protection are CLEANING and GREENING. Water, air, land... must be kept clean; the terrestrial surface, atmosphere and sea must be green and populated with rich and diversified fauna and flora, thus creating favourable environmental conditions for the country's sustainable development.

Environmental protection activities represent revolutionary ones involving all essential aspects of social life from the perception of every people to that of the whole society, from the change of habits to the formation of a new way of living with new practices, new occupations, new organizations. This is a long and complicated process. The objectives of our strategy are:

- Ensuring good quality conditions of air, water, land, and other environment factors as stipulated by the State for all inhabitants of the country.
- Ensuring the rational use of natural resources for an effective industrialization and modernization, restraining the use of non-recreative resources and striving to use recreative resources as much as possible for a better natural regeneration.
- Introducing new technologies and production, methods with little waste, utilizing non toxic or less toxic materials in production instead of toxic materials, raising the effectiveness of energy and materials for tuning out each unit of product, treating wastes discharged from living quarters and production enterprises following allowable standards. We think that EM technology may be very useful in this domain.
- Realistically and effectively taking part in the environmental preservation of the region and the world.

To achieve these objectives, attention must be paid to the following activities:

1. To improve the environment of urban and industrial zones, prevent the qualitative degradation of air, water, land, landscape and others environmental aspects which commonly occur in populated business centers and industrial zones, treat pollutants which have been emitted and prevent pollutants potentially emitted, research and apply

new measures for environmental improvement.

2. To improve the environment of densely populated rural areas and areas where intensive farming techniques are applied. These areas are in the course of an economic structural transition. A growing quantity of chemicals is intensively used in agriculture. The agglomerated population will entail the development of handicraft and industrial centers (for the processing of agro-products and manufacture of light industrial products); the export processing zones may be set up in some parts. Thus there is a threat of new pollutants in addition to agricultural chemicals which aggravate the pollution in rural areas. Therefore, it is necessary to utilize microbiological organic products instead of chemicals in cultivation and animal husbandry.
3. To establish and implement environmental projects for the country, economic zones and important river basins, Integrated measures must be taken to preserve the quality of ecological environment and the abundant and diversified natural resources; the environment protection must match the socio-economic development in the master plan of the whole country as well as in different economic zones such as the Red river delta, the North-Eastern part of North Vietnam, the North-Western part of North Vietnam, the Northern part of Central Vietnam, the coastal Southern part of Central Vietnam, the Eastern part of South Vietnam, the Central Highlands, the Mekong delta, and the basins of big and medium rivers.
4. To improve the environment of inshore and offshore areas and islands, prevent the degradation and pollution which are visibly increased parallelly with the development in full bloom of oil-gas industry, navigation, infrastructural construction, fisheries, tourism... in these localities.
5. To design and implement a strategy with detailed plans for environmental protection and utilization of natural resources in different sectors including agriculture, forestry, fisheries, industries, energy, construction, water conservation, transport and communications, tourism. Environmental protection activities must be done in both areas the recipients of pollutants and the original emitters of pollutants of which the technological links with direct impacts in the production chain must be considered.
6. To preserve and develop the biodiversity. In the general tendency of degradation of natural resources and environment, the country's biodiversity is prone to diminution and loss, especially genetic resources of both wild and tame fauna and flora. This is an urgent matter to be solved, otherwise a lot of valuable genes will exterminate forever.
7. To strengthen the capability of controlling disasters caused by both natural calamities such as typhoon, flood, drought, heavy rain, tsunami, hail, hoarfrost... and artificial catastrophes in industry, exploitation of natural resource, construction, transport and communications... Environmental catastrophes often grow up together with the pollution of labour environment. Serious loss of lives and property and environmental damage have been caused by accidents in oil-gas and mineral exploitation, chemical production, transport and communications, fires, explosions, collapse of construction works, gas escape... Especially in densely populated and socio-economically developed areas as well as coastal and prone to be flooded areas, the consequences in environmental destruction are extremely disastrous once such an accident occurs.
8. To strengthen the state capability in management of environment.

The above mentioned presentations are some urgent problems in Vietnam's environment and our action program. We hope the EM technology will be smoothly and effectively applied in Vietnam.

Many thanks for your attention.