

Reverse Integration of Environmental Concerns into Sectoral Policies through Simulation of Greener Development Plans: A Situational Analysis from India

Dr. Ashok Sharma, Chief Executive, Cleantech International Foundation, New Delhi 110019,
India

cleantechfoundation@vsnl.net

Keywords: Integrated Resource Management, Waste Minimization & Utilization, Internalization of Environmental Protection Costs, Innovative Projects, Fiscal Mechanism, Zero Impact Initiative.

ABSTRACT

Integration of environmental concerns into sectoral policies is a well-accepted strategy across regions, nations and societies. However, clashing and competing objectives often diffuse its desired directional impact. It is common to observe policies and regulation restricting the use of plastics and non-biodegradable materials mooted by the ministries like environment and urban affairs cohabiting with special task groups on *plasticulture* mooted by the ministry of Agriculture. Likewise initiatives of the ministries of health, environment and labor-welfare are easily frustrated by farm-subsidies on use of chemicals and pesticides. Liberalization supported by the ministries of finance, commerce and industries smoothen the way for dumping of inferior technologies with severe implication in terms of occupational health and safety or environmental impact in the name of foreign-investment, employment, regional-development and globalization.

Policy statements unless translated holistically into action projects, seldom make desired impact in real life and one often sees large-scale disposal of treated sewage just upstream of the intake for a drinking scheme or for that matter, a road constructed to carry out forestry operation doing more damage to vegetation. A so called clean hydropower project could sometimes wield greater global warming potential than an equivalent thermal power generation plant in its neighborhood while an innovative short-cut tunnel in the hills cut down air-emissions from vehicular traffic to a half.

This paper seeks to analyze such situations to simulate *Zero Impact Development Initiative* for the mountain state of Himachal Pradesh in India clearly outlining clean development opportunities. Examples include re-engineering of an energy intensive lift-supply drinking water project into a net energy-generating project to introduction of three-dimensional forest farming for simultaneous development of ecology and economy. A simulated re-cast of the *development plans as usual* will practically demonstrate the process of *reverse integration of environmental concerns* into sectoral plans and policies.

Integration of environmental concerns into sectoral policies for mitigating environmental impact of development projects is a widely accepted strategy across regions, nations and societies. Environmental impact assessment of development projects, internalization of environmental management costs and environmental regulation are integral part of governance today. Holistic approaches like cleaner production, green productivity and zero impact initiatives are catching up fast with wider acceptance for tools like public hearing, peoples' participation, NGO action and

public interest litigation. End objective in all cases is protection of the planet Earth ensuring a reasonable quality of life for our generations to come.

Clashing and competing interests offer sustained resistance to our endeavor to protect our global environment. Departure from (or absence of) a universal code of environmental ethics, political, societal, regional, ethnic and economic stratification and extreme selfishness cause reckless damage to global environment in terms of resource depletion, pollution loading and uneven distribution of societal welfare or quality of human life. Global governance finds deep roots in hidden motives like retention of economic, industrial and military power by the rich and powerful nations and entities who maintain their lead over the rest through exploitation, restrictive trade, discriminative dispersal of knowledge resources and dumping of inefficient technologies, risky processes and hazardous materials in the name of globalization. Examples like historically banned DDT exports to the developing world in the name of productivity and outsourcing of tannery products from poor nations in the name of trade promotion bear testimony to such moves.

Even within a national or provincial jurisdiction, ministries and departments charged with diverse responsibilities often conflict in terms of approaches purposes. It is not uncommon to find ministries like industry, commerce, petroleum and agriculture promoting 'plasticulture' as a way of life while others like the ministries of environment, science & technology or urban affairs struggling to ban the use of plastic bags or promoting alternative materials. Populist policies encourage subsidies on agricultural inputs like chemical fertilizers and pesticides in the name of farm productivity with ministries of environment and water resources fighting the menace of water pollution and struggling to protect the river water quality at tremendous cost with not much avail. WTO agreement has been perhaps the worst example of depleting the natural resources of third world giving way to their man made cousins like BT crops and GM products. The entire process of liberalization and globalization has been marred by incidence of dumping technologically inferior and environmentally hazardous technologies with long-term environmental implications. The ultimate cost of low productivity, wasteful processing, environmental damage and health costs more than offset the visible advantages like income or employment generation and economic advancement.

Isolated sectoral policies and proclamations are not only inadequate in terms of impact but also often conflicting in terms of objectives. It is important therefore to carefully analyze the implications of sectoral policies in terms of environmental impact likely to be generated by them and recast them targeting a zero impact scenario. Such an approach must essentially focus attention on an eco-efficient resource management featuring highest degree of resource utilization including zero waste and total recycling. It is pertinent to note that zero impact as an initiative must go beyond the realms of zero emission to include minimal consumption of inputs like raw materials and energy. In other words, development projects and activities must be designed to aim at zero consumption of prime materials or non-renewable energy or freshwater together with zero emission. Projects and activities so designed shall ensure a minimal pressure on prime natural or raw resources at the same time eliminating pressure on landfills. Such a situation featuring zero emissions would also entail zero wastewater generation or air emissions ensuring zero health implications.

Policy statements unless translated holistically into action projects, seldom make desired impact under real life situations. Although it still sounds logical to embark upon a set of eco policy thumb rules to guide the greening of development process, it is perhaps more logical to follow a reverse integration of environmental concerns into sectoral policies through simulation of greener development plans at a micro level as practical building blocks of the environmental impact reduction process. For example, while leveling a hill slope to make a terrace or a road, excavated material could be best used as a landfill to double the level ground created while totally eliminating any debris that could pose serious disposal problems or threat to the vegetation. Similarly, a reservoir-based irrigation project has the inherent potential to adapt into a multi-purpose project serving the drinking water needs of society and generating electric power at the same time. A short cut tunnel made in the hills could often cut down the vehicular emissions to a third apart from saving tremendous amount of petroleum resources on a recurring basis and a gravity-based water supply scheme could save tremendous amount of power used for pumping in a normal lift supply scheme. Each of the above examples holds promise of visible environmental impact reduction while ensuring bigger returns on investment. In all cases innovation holds the key to the success of such initiatives. In order to substantiate what has been said, Let us review a set of such initiatives undertaken to modify the sectoral policies and the development plans of the hill state of Himachal Pradesh in India where the author was involved as Chief executive of the State Pollution Control Board, during the past one decade to evaluate their strategic contribution to greening of development process and environmental impact mitigation.

Himachal Pradesh is a north Indian province situated close to Kashmir and Tibet comprising entirely of mountain region with peculiar topography and climatic conditions. Development planning of such areas not only takes harder effort at greater costs but also entails sensitive environmental implications including landslides, loss of green cover and irreversible pollution of water resources. Typical financial constraints of a developing economy force project planners to overlook environmental aspects of development projects so as to meet the pressing minimum basic needs of society. As a result, most road-building activity causes more damage to ecology than serve the mobility needs for want of slopes treatment and proper disposal of muck. Lack of investment in sewage treatment, garbage disposal and proper drinking water treatment manifests in rising healthcare costs and declining labor productivity. Glacial rivers with drinking quality of water at source are seen turning into highly polluted and dying water courses due to disposal of raw sewage and municipal garbage freely finding its way into such water bodies along with the runoff or otherwise. Absence of disposal facilities results in frequent illegal dumping of industrial wastes including hazardous wastes onto vacant lands and river-beds causing river as well as groundwater pollution.

However, responsive and sensitive state government machinery has over the years undertaken some initiatives to modify its development projects to minimize the environmental implications of developmental activity and ensure proper utilization of natural resources. These initiatives could be broadly classified into policy initiatives, program initiatives and future outlook and are reviewed as follows.

Significant policy initiatives

The state government through the initiative of the State Environmental Protection & Pollution Control Board introduced a variety of eco-friendly policy measures with far reaching implication

in terms of pollution prevention and environmental protection. Some of these initiatives are briefly summarized as follows.

- Compulsory internalization of environmental management costs as pre-requisite for budgetary sanction of development projects
- Mandatory public hearing before granting environmental clearance for industrial and other major developmental projects requiring such clearance
- Policy shift in favor of run-of-the-river projects as against reservoir based hydro electric power projects
- Ban on plastic carry bags supplemented by sales tax concession on sale of paper bags
- Ban on coal firing for internal heating in public offices
- Highest priority for food processing and herbal industries in state industrial policy
- Complete ban on change of land use in respect of forestland and mandatory compensatory plantation by all project authorities that are involved with felling of trees on private or government land for bonafide purposes. All other felling of trees made punishable and cognizable offence.

Significant program initiatives

- Cut and fill technique for land development and road construction to minimize damage to slopes, loss of green cover and costs involved.
- Compensatory plantation for loss of green cover because of development projects to be carried out by the state against costs to be borne by promoters.
- Levy of water pollution Cess on hydropower generation industry
- Extensive use of bio technology and productivity measures for increasing biodiversity, output and economic return on farm activity
- Designing gravity based water supply schemes to replace lift schemes
- Demonstration projects for garbage composting, incineration and wormi-composting
- Integrated river water quality improvement projects to prevent pollution of major rivers and other water bodies including ground water reserves
- Establishment of remote sensing facilities for GIS based environmental surveillance and environmental planning including preparation of zoning atlas for locating new industrial activity in accordance with the carrying capacity of the said zones
- Consulting services for pollution prevention under CLEANTECH project for environmental management beyond compliance in industries sector
- Consulting services for Environmental impact assessment studies and formulation of environmental management plans for major industrial and development projects
- Introduction of environmental education in formal education and active involvement of non governmental organizations and expert institutions in awareness generation and action oriented environmental protection projects

Some case studies on environmental initiatives

Although most of the environmental initiatives are ongoing and inter-related in nature, some of them that could be clearly evaluated in terms of visibly potential impact on environmental implications of development are highlighted below.

Levy of water pollution Cess on hydropower generation: The state pollution control board conducted a detailed study on the impact of reservoir based hydropower generation projects on water quality in reservoirs and other water bodies to establish the severe damage to water quality often caused by such projects apart from other ecological implications like global warming, climate change and depletion of carrying capacity in original water courses. It was established that anaerobic degradation of biomass and thermal stratification of reservoirs caused high degree of dissolved oxygen depletion, severe acidification and adsorption of bio accumulative chemicals of concern at the mud water interface with other implications like heavy metal inclusions, temperature rise and algal blooms drastically changing the ecology of flowing waters affecting the aquatic life. Based on the findings, the Water Pollution (Prevention & Control) Cess Act was amended to levy water cess on hydropower generation with a view to find resources for remedial action in terms of forestation, catchment treatment and water quality restoration.

What ensued was a long legal battle between the facility owners and the state board resisting such levy. Eventually, the union government buckled under political pressure of threatened increase in power tariff to withdraw the amendment. However, amongst many un-quantifiable benefits that accrued apart from awareness, significant to note are policy declaration in favor of *run of the river* projects in place of reservoir based projects, decision to avail free power to the state from the generators in lieu of non-consumptive use of water resources, and extensive guidelines for environmental protection and water pollution by the hydropower generators.

Public hearing for conflict resolution: In a noted case of public complaints against a large distillery, the author in his capacity as the regulatory authority under law, held a public hearing at the premises of the charged company where general public and peoples representatives were invited to visit the treatment facilities installed by the company. The facility owners were asked to reply to the issues raised by neighborhood and offer solutions. The tripartite proceedings were recorded as an enforceable agreement and the company promptly complied with assurances including capital-intensive measures. The success motivated the regulatory authority to adopt such hearings as an effective conflict resolution tool and based on a presentation of outcome, the national forum of pollution control boards recommended adoption of public hearing as a pre-requisite before grant of environmental clearance to all major industrial and environmental projects under the Environmental Protection Act.

Many other initiatives on introduction of clean technologies, waste-exchange for raw material substitution and zero impact manufacturing approaches resulted in avoiding landfill pressure and pollution loading saving billions of rupees annually to participants.

Simulating a futuristic green development plan

Encouraged with successful implementation of NORAD assisted integrated environment management project, the state planning machinery carried out detailed exercise to modify its development plans with a view to minimize the environmental impact of projects. A green development plan for integrated resource management aiming at zero impact on environment was embarked upon incorporating a continuous process of cyclic review to launch a Zero Impact

Development Initiative. Some of the salient sectoral initiatives and policy resolutions of this initiative as reproduced briefly as below.

Science & Technology Sector: Proliferation of zero emission manufacturing technologies, extensive application of biotechnology and information technology and building a culture for innovation management. Extensive application of GIS and ICT measures for planning, monitoring and environmental surveillance.

Industries & Mining: Zero Impact Manufacturing Initiative and Zero waste mining. Fiscal and financial incentives for eco-friendly manufacturing and implementation of pollution control measures.

Forestry & Farm sector: Green productivity and organic farming with extensive application of biotechnology and intensive cultivation of non-invasive exotic species. Food processing and zero waste post harvest technologies. Phasing out of farm subsidies on chemical fertilizers and pesticides. Utilization of minor forest produce and herbal resources including utilization of pine needles.

Irrigation & Public Health: Integrated river water Quality Management project, multipurpose utilization of water resources and recharge of groundwater resources. Eco sanitation and root zone based sewage treatment facilities.

Public works & Housing: Use of eco materials and recycling of demolition debris as construction material for total recycling. Construction of solar passive houses, earthquake resistant lightweight structures and high rate bio-methanation of organic wastes for energy generation and composting.

Transport & Tourism: Eco tourism and zero emission transportation based on hydrogen fuel cells. Ropeways and tunneling projects shall be extensively undertaken.

Education & Technical Education: Introduction of environmental education and environmental ethics into curriculum and strengthening of higher and vocational education in the field of environmental technology, cleaner production, environmental management and advance research in zero impact manufacturing & environmental technology.

Organizations like Himachal Productivity Council & Cleantech International Foundation are actively engaged in concurrently reviewing the current state plans to add innovative dimensions of their Zero Impact Initiative.

Brief personal profile of Dr. Ashok Sharma

Chief Executive, Cleantech International Foundation, 52/1 C.R.Park, N.Delhi
110019, India
ashokaks@hotmail.com



Born on 3rd of August, 1952, Ashok Sharma is a mechanical engineer with specialization in industrial engineering followed by post graduation in economics and advance doctoral research in environmental technology. Currently a visiting fellow of the Japan Society for Promotion of Science (1999-2003), Sharma served for about two years in the private sector as a tool room engineer before taking up his assignment as a Senior Technical Officer in the Himachal Pradesh department of industries in 1976. After serving there till 1993 he took over as Member Secretary of the HP State Pollution Control Board where he stayed for a period of five years. He also held the position of Chief Inspector of Boilers, Himachal Pradesh along with his other positions from 1986 to 1998.

During his stint as Member Secretary of the HP State Pollution Control Board, he brought about revolutionary changes in its functioning to make it financially self sufficient and equipped with best manpower, equipment and technology. HP Board was the first to initiate environmental consultancy to help industry improve compliance standards and acquired global recognition for highly innovative work in cooperation with industries. Contributing a number of international environmental cooperation projects and arranging finest international training for the board staff, he initiated a number of innovative schemes that brought the HP State Pollution Control Board, recognition as one of the best managed state boards in the country.

As a widely traveled international expert on industrial and environmental technologies, he acquired international recognition and pioneered the concept of cleaner production for pollution prevention in India and abroad. He has been involved with most of the international organizations concerned with productivity, technology and environment and has participated in a large number of professional events on industry and environment around the globe including Germany, France, USA, Netherlands, Hungary, Japan, Taiwan, Korea, Thailand, Singapore and Phillipines. As a productivity activist he organized more than 120 training programs and conferences on productivity and environment and evolved CLEANTECH as a proprietary enviro-management technique for pollution control through source reduction methods with assured compliance and sharp payback. The technique has been implemented in over 150 industries with phenomenal success achieving zero discharge in many instances. His work on development of zero emission technologies as a visiting fellow of the Japan Society for Promotion of Science has been significant and found wider acceptance with industry and academia both at home and abroad. Recognizing his contribution to evolution of cleaner production technologies, The UNEP invited him to the Asian Roundtable on Cleaner Production in Seoul as signatory to the international declaration on cleaner production in 1995. Taking note of his original contribution to global

water quality conservation, the Asian Productivity Organization have fielded him as an Asian expert of water issues to present the Asian scenario on water conservation with particular reference to Indian experience. He has been invited by the Stockholm symposium committee as an invited speaker to address the forthcoming Stockholm Water Symposium to be held during August 2002.

His area of expertise extends over transfer of eco friendly manufacturing technologies to advanced control techniques for hazardous wastes management and disposal apart from innovation based business process re-engineering for zero emission in industry. He has been a frequently invited productivity protagonist visiting Japan several times since 1984 and has made pioneering contribution to the concept of green productivity in Asia. His recent work on ***virtual waterless manufacturing*** has astonished the international community of water conservation experts who now look to India for innovative manufacturing technologies and practices. The Global Environment Center of the Kyoto University has proposed a long term Indo-Japanese environmental technology co-operation program through his involvement as an eminent expert in his individual capacity as a rare honor.

A scarce combination of academic accomplishment in industrial engineering, economics and environmental technology followed by unique variety of experience in private sector, administrative department, regulatory authority, non-government organizations and individual scholarship spiced with abundant international experience in technology cooperation and fund-raising has equipped him with visionary ability to steer any national or international organization to soaring heights.