

S&T CAPACITY-BUILDING FOR SUSTAINABLE DEVELOPMENT *Zahid Aziz** IN THE ENGINEERING AND INDUSTRIAL SECTORS

ABSTRACT

The major stimulus to the economic growth and development of rich countries has been their reliance on engineering to produce plant & equipment. This, in turn, provided them with a sustainable base for creating employment-opportunities and raising their standards of living. In the wake of WTO, we need to identify our tangible standing vis-a-vis the competitors and the world around us. The world trade competition is posing a serious threat to our local industry. It is in this perspective that we have to fall back on the engineering and manufacturing sector to chalk out a road-map towards sustainable development.

The key ingredients for capacity-building are Human-Resource Development enabled with technological upgradation, keeping in view the environment-saving elements. LDCs have shown an increasing preference to adopt the proved Euro-American Model of broad-spectrum industrialization as a panacea for expeditiously solving the problems that arise out of poverty, illiteracy, rapidly expanding populations, with diminishing food / energy-resources.

Keeping in view the above scenario, an evaluation needs to be done on our part as to what has been done so far by the Ministry of Industries & Production to Address this issue and how successful have we been in our efforts through using instruments like tariff rationalization, technical education, quality standards, regulation and deletion programs.

SUSTAINABLE DEVELOPMENT

Sustainable industrial development can be defined as a pattern or patterns of development that balance a country's concerns for competitiveness, for social development and for environmental soundness¹. Sustainable development is based on the principles of participation and partnership between international organizations and governments; between central and local government; between government, private enterprise and non-governmental organizations; between communities and women and men in households. It requires a clear understanding of the

different capacities and potentials of each stakeholder and their needs for support and incentives that will enable them to play a full and progressive role in the planning and management of development.

Economic development is crucially dependent on industrial development², both with respect to the industrial sector's pivotal contribution to economic growth, as well as the structural transformation of an economy. Also, social development is strongly impacted by industrial development. Often, industrialization is seen as a motor behind many of the processes usually termed "social transformation" and "modernization". More specifically, there are at least three ways in which industry helps to achieve the goals of social development:

- Industry's substantial contribution to economic growth helps to create a large portion of the resources needed to fund social-development programs;
- Creation of employment and hence generation of income take place in the industrial sector directly, and are indirectly fostered in other sectors — like agriculture or services — through their linkages to industry;
- Industry promotes various aspects of social integration, through its general thrust towards modernization, and makes a specific contribution to the integration of women by way of productive employment.

Industry provides a typical example of a sectoral aspect of sustainable development: industrial issues — cutting across the environmental, economic and social dimensions — figure prominently in the sustainability debate.

Environmental constraints to development are acutely felt in the industrial sector, in relation to both production and consumption of manufactured goods. Here the key to solving many of the problems lies in technology. Remedial policy-measures are needed to reduce or eliminate such effects. The response of industry to such policies is, in almost all cases, of a technological nature. Hence industrial technology and

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its continuous innovative change, if properly shaped by market and policy incentives, make an important contribution to solving the environmental sustainability problem.

Development managers and planners must recognize the fundamental need for the integration of economic, social and environmental planning.

THE GLOBAL PERSPECTIVE

Humans are conducting an uncontrolled experiment, unprecedented in scope and scale, that represents the reversal of natural evolution which produced clean air and water and increasingly complex and diverse ecosystems - systems that made human evolution possible. These changes, a result of unsustainable and inequitable patterns of production and consumption, are likely to accelerate with the addition of 81 million people to the planet each year. We are a society living off its natural capital, not its income. We are acting like a planet in liquidation.

Current strategies to meet human needs are not sustainable. Around 1.5 billion of the world's population is below poverty line. Eighty percent of the world's resources are being consumed by 20 percent of the world's population. The world's poorest 20 percent earn 1.4 percent of the world's income. The world will need an unprecedented 2 billion jobs in the next 20 to 30 years in order to employ the current 800 million underemployed and unemployed people and the new job seekers who will enter the market³.

While it is necessary to build and enhance strong scientific and technological capacity in all regions of the world, this need is particularly pressing in developing countries. The responsibility for building and maintaining this capacity lies squarely on the shoulders of national governments, but requires significantly enhanced collaboration and partnerships with the private sector, the global development assistance community and the science & technology community.

WHERE DO WE STAND?

The Pakistan Government has committed itself to sustainable development, aimed at economic growth in harmony with the environmental preservation and,

at the same time, improving social conditions such as health and education. Initiatives have been taken to implement a long-term capacity-building program, especially concerning the WTO issues. The objective is to ensure a meaningful and constant dialogue between the government, private sector and other non-government stakeholders, on trade policy and the WTO obligations of Pakistan. There is still great room, as the current steps are not substantial enough to sustain in the post-WTO scenario.

Certainly, there are great contributions from the private sector; specifically, the organizations like SDPI (Sustainable Development Policy Institute) and IUCN-Pakistan (International Union for Conservation of Nature and Natural Resources) has done a remarkable job till now in identifying and underlining the matter. They have also convened dialogues at different levels to address the issues. This trend needs to be encouraged. At present, Pakistan is in a far from satisfactory position to accept and face challenges of the non-compliance to Global agenda for Sustainable Development. The engineering industry, particularly, is weak and its share in manufacturing as well as in exports is very low, as compared to our competitors 2-3 decades back. Pakistan engineering exports are 0.009% of the total world-market. High technology exports are only 0.3 % of the total exports; average steel consumption is 20KG/per head, as compared to the world average of 200KG/per head. There are only 249 PhDs in engineering and related sciences at present in the public-sector universities. This is itself a clear indication that a much-awaited national strategy has to be developed and executed before time writes us off. In the past, Pakistan has signed various international protocols, without fully realizing its implications.

Ministry of Industries & Production positively realizes the seriousness of the matter and has therefore focused its policy-thrust on engineering industry, specifically, to help prepare a sustainable environment essential for the other industries to compete economically and efficiently. A number of steps have been taken/initiated, emphasizing the underlying seriousness of the matter. These steps include the launching of Textile Vision, Engineering Vision, Leather policy, Fertilizer policy; all aiming at building a sound technological base, with industrial-support departments and R&D institutes. Tariff rationalization,

reforms in regulatory, legal and policy environment are being introduced to remove barriers to growth and make our industry, specifically engineering industry, internationally, competitive. Also the investment-plan 2003-2010 for technology support centers and strengthening engineering-units being launched. The ISO standards have already been adopted.

The future plans are: to increase share of manufacturing goods in GDP from current 17.2% to 25 % by 2010, and gradually move to 30% in the future; especially, the share of engineering-goods to grow to 30% of the manufacturing goods in ten years. Also it is likely to increase per capita income to \$1000 by year 2010. These plans might not look realistic but, we have got to be that ambitious, we have got to strengthen our engineering base, we have got to upgrade the current technologies and adopt the new over, we have got to furnish technical manpower. As a matter of fact, this is all possible, but a definite will is required on our part, domestically. To achieve sustainable development in today's context of market and private-sector-driven development, the developing countries require support from the industrialized countries, to build up basic capacities. Still, we need to indigenize our production-processes. Although the North has a crucial role to play over here, but let us not forget our own strength. We can very well initiate and rely on south-south partnerships. There is an immense need to address the impact of the so-called "brain-drain" on science capacity building. Mobilization of expatriate third-world scientists, living and working in the industrialized countries, to examine critical problems in developing countries could prove instrumental in turning the brain drain into a brain gain.

But the industrialized countries must not forget their imperative role. Their focus should be on the exchange of ideas, communication of scientific information and development of scientific industrial standards and networks in the developing countries.

IDENTIFICATION OF THE PROBLEM

We need a paradigm-shift in the relationship of humans to the environment and each other, in which humans live in harmony with both natural systems and each other. We cannot achieve these results with our current thinking.

A psychologist once remarked that a definition of insanity is doing the same thing over and over again and expecting a different result. As Einstein observed, "the significant problems we face cannot be solved at the same level of thinking we were at when we created them."

Therefore it is high time that we give deep thought to the matter. After all, it's a question of our own self! Our life ... Our future ... Our children ...

VISION FOR A JUST AND SUSTAINABLE FUTURE

A first step in the transition to a sustainable path is to shift from problem-solving to creative action.

The foremost object should be to alleviate poverty from the developing countries, the fact is contrary to the commitment as said by United Nations secretary-general, *Kofi Annan, at the 32nd meeting of World Economic Forum, in which he had stated that "business leaders of the world were not sharing enough to eradicate poverty."* This itself is crucial for the very sustenance of the business leaders as well. As a hard fact which even they cannot deny.

A growth of \$ 500 in per capita GDP in the developed world would not make any significant increase in the level of obtaining prosperity. But a similar growth in economies like ours would make a significant impact. Future scientists, engineers, and business people must design technology and economic activities that sustain rather than degrade the natural environment, enhance human health and well-being, and live within the limits of natural systems. The desire for a continuing "cheap" supply of fossil fuels has had enormous military and economic costs to keep the oil and gas flowing around the world, especially from the Middle East. Moreover, this fossil fuel dependence is economically unsustainable for more than a few decades - it takes 10,000 days for nature to create the fossil fuels that society consumes in one day!

The vision of a sustainable future is one in which:

- The population is stabilized at a level that is within the short and long-term carrying capacity of our finite resources;
- The toxic wastes are dumped properly in such a manner that they do not pose a threat to the

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environment and human themselves. Humans are the only species on earth that produce waste which is not a raw material or nutrient for another species;

- The renewable resources are used at a rate less than or equal to the natural environment's ability to regenerate the resource; this means living off the income, not the capital;
- The production of durable, repairable goods and eliminate persistent, toxic and bio-accumulative substances is increased; at the same time, disposable goods as much as possible are eliminated;
- Products are designed for disassembly, so that the materials could be utilized in making new products;
- The reliance on the energy extracted from non-fossil fuels is increased, as the use of energy from the fossil fuels causes major environmental and health problems, such as black lung disease, air pollution, acid rain, oil spills and global climate-change, to name a few. The desire for a continuing "cheap" supply of fossil-fuels has had enormous military and economic cost to keep the oil and gas flowing around the world, especially from the Middle East. Moreover, this dependence on fossil-fuel is economically unsustainable for more than a few decades - it takes 10,000 days for nature to create the fossil-fuels that society consumes in one day!⁴
- It might be apparently over-ambitious but, at some later stage, reliance on direct solar energy is essential for our economic system;
- Timely economic and social signals that encourage environmentally and socially sustainable behavior.

The economic measures of success we use today, such as the GNP and consumer price-index, discourage conservation and encourage waste, consumption, and the substitution of capital for jobs. The price of goods and services reflects all the profits to the producers, but does not include all the social, environmental and health costs to society. This needs recosting.

WHAT IS TO BE DONE?

The challenge ahead is to foster the sustainable development of competitive industries, create employment, generate income and thus contribute to

the alleviation of poverty, illiteracy and all kinds of social hardship. The focus needs to be on the creation of employment, on higher value-added products and increase of competitiveness in export markets, as well as the improvement of institutional capacities and capabilities for environmental, energy and product-quality management. The following steps need to be taken in order to achieve the stated targets:

- Implement international agreements, primarily the Montreal Protocol, the UN Framework Convention on Climate Change and the Basel Convention;
- Develop ISO 14000 environmental management systems certification scheme;
- Create awareness of national and international best-practices in the fields of technology, management-systems, and policy;
- Improve the understanding of sustainable development and, in particular, the business opportunities that sustainable development presents in Pakistan;
- Encourage industry, government and community-organizations to adopt initiatives that result in the improved use of eco-efficiency and cleaner production among their constituencies;
- Build common demonstration effluent-treatment plants for the textile and leather industry;
- Implement industrial policies that provide an enabling framework, within which the private industrial sector can operate with full efficiency and competitiveness;
- Raise awareness of potential foreign investors and technology-suppliers of investment opportunities
- Develop strategies and related institutional framework to enhance the development of more efficient and competitive small- and medium-scale industries;
- Encourage the formation of industrial clusters that provide cost-effective access to highly specialized economic inputs;
- Industrial Information Network, providing information and value-added support for SMEs.
- Increase the output of agro-based industries (food, textile and leather processing industries) by modernization and build support of the development of such industries;
- Identify the managerial and technical skills needed to expand specific industrial sub sectors.

- Formulate an environmental strategy that sets risk-based pollution-reduction targets and realistic time-frames for compliance;
- Build national capabilities for development of energy-management systems; promote renewable energy by introducing clean and new technologies;
- Develop human resource in the field of industrial energy efficiency;
- Develop and implement energy-saving, co-generation and recovery systems in selected industries and demonstration plants;
- Promote technologies for generation of “renewable” energy in order to reduce environmental pollution;
- Assist development of environmental regulations and transfer of advanced environmental practices for management of large cities;
- Assist development of environmental monitoring and pollution-control systems in the private sector.
- Advise industry on the best combination of pollution-prevention and abatement options that would mitigate environmental problems;
- Offer training programs that expand the availability of technical, managerial and entrepreneurial skills.
- Create a cadre of highly qualified professionals, so that they can perform functions related to technology-promotion;
- Encourage women entrepreneurs in industry, with a combination of training and consultancy services;
- Promote innovative and appropriate technologies for commercial applications in specific manufacturing branches.

This whole system needs to be executed in a precise and appropriate manner. This would require continuous monitoring and feedback, which is crucial for any mid-course correcting action. For such purposes, UNIDO has identified certain industry-specific indicators that cover all three dimensions of sustainable development.

CONCLUSIONS

Many of the problems that Pakistan is facing, viz. self-inflicted: poverty, food security, shelter, illiteracy, are central social problems. The country needs to set its house in order. There is also a need to develop the capacity to deal with the external problems. The hard fact, however, is that the latter is impossible without the former. A fundamental change in the policy-implementation is required.

Unless current attitudes are changed, we will continue to experience economic nightmares and socio-political disorder. The goals for sustainable development must not be treated as a tool in the hands of the industrialized world, to exploit the much lagged developing country's industry; rather they should be taken as a collective global aspiration for a better planet for our children.

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