

THE ROLE OF UNIVERSITIES IN S&T CAPACITY-BUILDING FOR SUSTAINABLE DEVELOPMENT

Khalid Farooq Akbar*

ABSTRACT

The basic characteristic of developing countries is poverty. What is needed is a new, people-based, sustainable development, with a focus on broad-based rural development and resource-conservation. It can prove to be the most effective way of tackling poverty in the South.

Finding a sustainable way of life, socially, economically and environmentally, is one of the greatest challenges facing humanity today. Science and technology are important components of aggregate national strength and one of the fundamental bases for sustainable development. Without the support of advanced science and technology, the objective of sustainable development cannot be realized. The thesis that science and technology constitute a fundamental productive force has been universally accepted. Education is critical for improving a country's capacity in science and technology and to address issues related to sustainable development. It is just as important for Education to arrive at sustainability, as for the economy, legislation, science and technology, and furthermore, is a prerequisite for all the aforesaid.

Universities, being the fountainheads of knowledge, should play a leading role in developing a multi-disciplinary form of scientific education, in order to devise solutions linked to sustainable development. The universities should, therefore, commit themselves to an on-going process of educating, training and mobilising all the stakeholders of society linked to sustainable development so as to ensure a sustainable and just world.

To achieve this, the universities should plan and implement their academic activities on the basis of the following principles:

- i. The universities should incorporate a sustainable-development perspective in all teaching and research activities, including science education and develop the necessary teaching materials.*
- ii. The universities should organise and co-ordinate comprehensive, multi-disciplinary and collaborative academic programs in science-education in order to develop and adopt appropriate environmental and resource-*

management policies to achieve sustainable development.

- iii. Develop effective guidelines and policies to attract and encourage large numbers of talented people to engage in science and technology for sustainable development and to build up a well-organized and able contingent of scientific researchers.*
- iv. To prepare motivated and trained manpower that is able to implement policies for sustainable development: the universities should make efforts to develop capacity-building programs for scientific, political, economic and other decision-makers.*
- v. To meet the needs of education and training in an ever-changing scientific world, the courses and programs providing traditional campus-based education need to be suitably modified for their incorporation into a continuing education and training system.*

INTRODUCTION

The basic characteristic of developing countries being poverty, what is needed is a new, people-based sustainable development, with a focus on broad rural development and resources-conservation. It can prove to be the most effective way of tackling poverty in the South.

Finding a sustainable way of life, socially, economically and environmentally, is one of the greatest challenges facing humanity today. Science and technology are important components of aggregate national strength and one of the fundamental bases for sustainable development. One of the biggest hurdles in achieving sustainable development in the developing countries is the need to generate the capacity to apply science and technology to this goal. 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 Organization for Economic Cooperation and Development (OECD) countries spend annually more on research and development than the economic output of the world's 61 least developed countries. Developing countries must address this problem and make capacity-building in science and technology, a prime priority area in their struggle to achieve the goal of sustainable development.

* Plant & Environmental Biologist, H.No.89/X, Scheme No. 3, Farid Town, Sahiwal. Email: kezam@brain.net.pk

Continuous advances in science and technology can effectively help in:

1. Formulation of policies for sustainable development;
2. Promoting the upgrading of the management for sustainable development;
3. Deepening humankind's understanding of the relationships between man and nature;
4. Expanding the supply and availability of natural resources;
5. Enhancing the utilization and economic benefits of resources; and
6. Providing guidance for the protection of the environment and natural resources.

These capacities are critical if we are to alleviate the contradictions among the South's population and economic growth and limited resources, while attempting to increase the environment's capacity for sustainability and to improve the quality of life, thereby realizing the main objectives of sustainable development.

EDUCATION AND CAPACITY-BUILDING

The capacity-building in science and technology encompasses a multiplicity of resources, actors and organizational and institutional components, interacting in a long-term systemic process. Among these, education is the critical component for improving a country's capacity in science and technology and to address issues related to sustainable development. Education is just as important to arrive at sustainability as the economy, legislation, science and technology and furthermore, is a prerequisite for all the aforesaid.

UNIVERSITIES AND CAPACITY-BUILDING IN S&T

Universities, being the fountainhead of knowledge, should play a leading role in developing a multi-disciplinary form of scientific education, in order to devise solutions linked to sustainable development. Universities and other institutions of higher education are, in fact, a necessary component-the crucial node-in a healthy system of development of science and technology for sustainable development.

The main function of universities is to train the future generation of citizens and develop capacity in all fields of knowledge, both in technology as well as in the natural, human and social sciences. For this purpose, universities should strive to fulfill the following aims:

1. To prepare a solid basis for more efficient, coherent and responsible development of economic, financial, human and natural resources;
2. To strengthen national capacities, particularly in scientific education and training so as to enable governments, employees, and workers to meet their developmental and environmental objectives and to facilitate the transfer and assimilation of new, environmentally-sound, socially acceptable and appropriate technology and know-how.
3. To prepare adequately trained and adaptive workforce of various ages, equipped to meet the growing environmental and developmental problems and changes arising from the transition to a sustainable society.

To achieve these objectives, our universities should plan their academic activities and emphasize the following features:

- Institutional Commitment

Universities should demonstrate real commitment to the capacity building in science and technology within their academic milieu. For this purpose, a policy for sustainable development should be incorporated, as basic criteria, in the medium and long-range planning of all academic activities. All the faculties, including S&T faculties, should include courses on sustainable development in their educational and research programs.

Universities should develop a well-structured scientific and technological system for basic research, applied research and engineering design and should strengthen new and high-tech research for sustainable development.

- Interdisciplinary Approach

The challenges faced by the present world are so complex and multifaceted that research and education have extended beyond the traditional faculties, and so activities in scientific research require huge investments and a concerted effort by large groups, to combine their knowledge and ensure continuity.

At present, in our universities, most of the students receive a mono-disciplinary training of high specialization or oriented to specific topics, and their efforts are geared towards individual performance rather than collective work. The present landscape of scientific education and research is similar to a deep tunnel instead of

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wide horizons. The tradition of dividing knowledge into separate subjects and encouraging competition between different scientific disciplines has become outdated.

To improve this, universities should encourage inter-disciplinary and collaborative education and research activities for sustainable development. The universities should open themselves up to new trends, in order to break through disciplinary boundaries and to join forces with other institutions and professions. The universities should create mechanisms in their organisation that foster and legitimise interdisciplinary work, in particular, financing research projects that bring together multidisciplinary teams for addressing real problems. The university administrators should promote extensive exchange and cooperation among scientific researchers in all fields and from all parts of the country, and enhance exchange and collaboration in the fields of scientific research, teaching and production.

– Cooperation with other Sections of Society

Universities should take initiatives in developing partnerships with other concerned sections of society, in order to design and implement coordinated approaches, strategies and action-plans to increase their capacity-building activities. Universities should launch programs involving coordinated participation of other institutions, provincial and federal governments, business community and NGOs. University students need to be trained in working with communities, while at the same time other sections of society should be induced to recognize the value of capacity-building in science and technology for sustainable development.

To ease the financial problems, universities should develop schemes, in partnership with other organisations, to relieve pressure on university budgets. The help of voluntary organisations and private enterprises can play a positive role in implementing R&D plans of universities.

– Priority Areas for Capacity-Building in S&T for Sustainable Development

For universities to take a lead in the changes required for science to respond to the challenges of sustainable development, they must revise their curricula, as well as the organisation and

assessment of research. They should emphasize efforts on the following areas:

- Agriculture is the largest sector in most countries of the South and universities should devise plans to adopt a gradual shift towards sustainable agriculture.
- Modernizing the energy sector is necessary for sustainable development, and our universities should take measures to increase energy- production and efficiency of energy-use.
- Conservation of biodiversity, including fauna, flora, other habitats and landscapes, and preservation of cultural heritage of developing countries.
- Integration of environmental considerations into business, industry, transport and urban planning.

– Continuing Education and Training

In the present world, the pace of development of scientific knowledge is so fast that initial education and a single degree can not provide a sufficient basis for a life-long career. There is a growing demand for a new type of educational and training system that should provide facilities for mid-career or supplementary training. Our universities should gear up to fulfil this need, by revamping the present system of curriculum development, methods of examination, etc., and increase the facilities for continuing education. To achieve this, the courses and programs providing initial education need to be modified for their incorporation into a system for continuing education and training.

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