

2nd Indian Youth Science Congress

SRM University, Chennai

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Inaugural Address

Sustainability : Our Challenge, Our Future

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2010-11 has been declared by the United Nations as the International Year of Youth. "The International Year is about advancing the full and effective participation of youth in all aspects of society. We encourage all sectors of society to work in partnership with youth and youth organizations to better understand their needs and concerns and to recognize the contributions that they can make to society." The focal theme for the International Youth Day (12 August 2010) is "*Sustainability : Our Challenge, Our Future*". Hence I would like to offer a few remarks about the implications of the focal theme for our young scientists.

At the outset, I would like to express my gratitude to Dr T R Pachamuthu, Chancellor, Prof P Sathyanarayanan, Vice Chancellor, SRM University, and all the faculty and scholars of this dynamic educational institution for undertaking the responsibility of organising the 2nd Indian Youth Science Congress. I am also grateful to Dr Ajay Parida, Executive Director, Dr N Parasuraman and all other scientists and scholars of MSSRF for working with colleagues in SRM University in getting this important Congress organised.

Youth constitute the genuine majority of our population. In contrast to many other developed and developing countries, we are a land of the youth. Therefore, young scientists have a unique opportunity for harnessing science and technology for shaping the economic, ecological and social future of our country. For mainstreaming the concept of sustainability in our research and development work, there are six major principles which our young scientists will have to keep in mind. I would like to refer to them briefly

- **Ecology** : Environmental sustainability is fundamental to lasting progress in every field of human endeavour. Unfortunately, the ecological footprint, measured by the per capita consumption of natural resources, is overtaking the biocapacity of ecosystems to meet the demand. Industry should realize that good ecology is good business and should therefore ensure that their inventions and products help to enrich the environment and not destroy it. The most important aspect of ecologically sustainable development is the conservation and enhancement of life support systems consisting of land, water, biodiversity and climate. Climate change will lead to unfavourable alterations in temperature, precipitation and sea level. Genetic material will have to be developed for promoting climate resilient farming methods. Biodiversity conservation needs to be stepped up at all levels – genes, species and ecosystems.

2010 is also the International Year of Biodiversity. With the advent of molecular genetics, every species on our planet has become important, since novel genetic combinations can be produced through recombinant DNA technology. We must build gene banks for conserving for future generations a representative sample of existing genetic variability. Also, we need a national grid of gene banks for a warming India. One woman and one male member of every Panchayat should be trained as Climate Risk Managers.

- **Economics** : In the ultimate analysis, economic sustainability is essential for ensuring the longevity of the enterprise. Unfortunately, there are possibilities of economic growth rates being affected adversely by international financial events. Every effort

should be made to maximize the benefits of available financial resources. Outlay-outcome relationships should be improved in relation to public investments. Steps should also be taken to strengthen the insurance system in order to reduce risk. Ecological economics takes into account the depreciation caused to natural assets through unsustainable development.

- **Equity** : Economic growth which is not based on equity will lead only to short term gains. Equity has three major dimensions :
 - a) First, **inequity at birth** arises from maternal and foetal undernutrition resulting in the birth of babies with low birth weight (LBW). Such LBW children will suffer from many handicaps in later life including retarded brain development. Therefore the nutritional status of pregnant women, mothers and young babies needs immediate attention. Inequity at birth is the cruelest form of inequity
 - b) The second form of inequity is **intra-generational** as manifested by poverty, hunger, illiteracy and ill health in the adult population.
 - c) The third form of inequity is **inter-generational** affecting the children yet to be born. Environmental damage, climate change, biodiversity loss, depletion of the aquifer, soil degradation and other forms of damage to basic life support systems will be harmful. Therefore, ecological economics should be promoted to mainstream a consideration of the needs of coming generations in current development plans. The genetic deformity occurring in children of the victims of the Bhopal gas tragedy is an example of intergenerational inequity.

- **Employment** : Modern industry promotes **jobless growth**. In contrast, agriculture and micro-enterprises foster **job-led growth**. We should conduct an employment impact analysis of all development programmes since jobless growth will turn out to be joyless growth and lead to frustration and violence.

- **Ethics** : As the power of science grows, there has to be equal emphasis on responsibility and accountability. The bottom line in ethics based development is

human wellbeing on a sustained basis. All laboratories carrying out research which may have potential adverse implications for human and environmental health, should have an Ethics Committee which proactively determines the ethical problems surrounding the use of frontier technologies like genetic engineering, somatic cell cloning and nano-technology. A suitable regulatory mechanisms also should be put in place, which inspires public, professional, political and media confidence.

- **Energy** : A key requisite for sustainable development is clean energy. It is now clear that we must concentrate on renewable and clean energy sources like solar, wind, hydro, biomass, biogas, etc. Mitigation measures in relation to climate change depend heavily on low carbon intensity in the development pathway. Nuclear power is a clean energy option but unfortunately there are problems connected with nuclear waste disposal. The energy mix adopted should help to reduce greenhouse gas emissions in the atmosphere.

To sum-up, we can harness the power of frontier science and technology for public good, if we are able to undertake a proactive analysis of risks and benefits associated with the technology based on considerations of ecology, economics, equity, ethics, employment and energy. A proactive impact analysis will ensure that undue risks are avoided and that the scientific and development programmes undertaken will lead to lasting benefits to human wellbeing and security. Young scientists will have to be the prime movers of sustainable development. Also, youth should promote sustainable life styles and thereby reduce our ecological footprint. At the same time we should enhance the biocapacity of our ecosystems through soil health enhancement, water harvesting and sustainable use, harnessing renewable energy, conservation of biodiversity and reducing the imbalance between carbon emissions and absorption.

I would like to recall on this occasion what Jawaharlal Nehru said about 60 years ago

“The future belongs to science, and to those who make friendship with science”