

Global Challenges: Response to GC 35: Ecology and Eco-Justice

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Abstract: This article explores the notion of ecology in the context of institutions of Tertiary education and the contribution Universities and Colleges can make in creating environments that include ecologically sustainable development practices. The vital role of the educated youth in building a sustainable future for the population is irrefutable. It presents the need for comprehensive approaches to ecology within the higher education system, and offers suggestions about how this can take place. It places on record the plight of the efforts undertaken so far (which failed to impact). It invites the readers to: a) make decisions on how best our fellow humans could be informed of the urgency to ensure long term health and productivity of the natural ecosystems; and b) to create a healthy, enduring society. Equally, it is a challenge to lay down the small steps required at the local levels that would result in a cascade of magnificent efforts meeting these urgencies. For, development of a workforce that recognizes and responds to local agendas, as well as recognizing that we are now players on the global stage, is only one component of the necessary actions for ecological sustainability. The College and University sectors need to be committed to the concept of ecological sustainability and that concept must be put into practice. Ecological sustainability is our biggest challenge – as educators, as practitioners and as citizens. The future poses its challenges and if those challenges are met the sustainability of our total environment will be our reward.

“We know more about the movement of celestial bodies than we do about the soil underfoot” Leonardo da Vinci

We stand at a critical moment in Earth’s history. It is high time when we must choose our future. We have to acknowledge that we are part of vast evolving universe. Whether we accept it or not, humans are called to be the stewards of the total nature. As the world becomes increasingly inter-dependent and fragile, the future at once holds great peril and great promise. Accordingly, to move forward we must recognize that in the midst of a magnificent diversity of cultures and traditions, economics and politics, religions and ideologies, histories and peoples, life forms and loyal norms, we are one human family and one cosmic community with one common destiny.

The contemporary modern society is not sustainable. Year after year and decade after decade, we are witnessing mammoth efforts, on the global scale, of mitigating catastrophes. The central issues of the present crises - global warming, peaking oil and gas, species extinction, water shortages, global hunger, alternative energy sources, sustainable development, and eco-justice are the consequences of the neglect of ecology in terms of either resource use and/or management of the environment¹. The dominant development paradigm of the past two centuries has been industrialization. This paradigm is inherently flawed, for it is strategized to be competitive, extractive, exploitative, and is ultimately dependent upon finite stocks of non-renewable resources², on which its productivity is underpinned. Since resources are not sustainable, any system that is dependent on them will be unsustainable too.

Ecology, as a science, attempts at relating living things and humans to each other and to the environment. Care of the environment affects the quality of our relationship with God, with other human beings and with creation itself³. This relationship has been envisaged to be harmonious and balanced, for nature provides all living things with the life-supporting systems. Sustainable development is one that meets the needs of the present generation without compromising the ability of future generations to meet their own needs⁴. It contains within it two key concepts: the concept of ‘needs’, in particular the essential needs of the world’s poor, to which priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs. Thus the relevance and centrality of humans to issues of sustainability is focused obviously.

Hence, we must integrate human behavior and sociology with economics of development in finding ways to work and to live in harmony with each other, with other living things, and with our natural environment, which is Divine Creation. The universe in

God's primary revelations for it is still unfolding and revealing the nature of God through the nature of the earth. In heeding the call to restore right relationships with creation, we have been moved anew by the cry of those suffering the consequence of environment destruction⁵.

Nature's dynamics

The big questions of sustainability are rooted in some of the most basic laws of nature. Look at the one thing the whole world dynamics revolves around – energy, the origin of all its forms being the solar system, and its transformation obeying the laws of thermodynamics. The solar energy “meets with” living systems (green plants) for its first successful conversion, which is the step that makes the energy available for use by man⁶. Plants on land and in the oceans capture and store solar energy and forms the first vital link in the energy flow through food chain.

The human life on earth remains dependent upon the dynamics that emanates from this energy flow through other living systems. The lesson from the nature is that a human society must conserve, recycle, and reuse materials and energy, if it is to sustain the balance in relation to the carrying capacity of the earth. The dynamics renders the living systems one of regenerative system, capable of renewing and reproducing themselves, of maintaining their productivity and vitality from generation to generation, indefinitely. This capacity of the living systems to produce, renew, and regenerate depends upon its strength and health, which in turn depend on the health and strength of the relationships among its various structural components, of which man is one.

The interaction of the components of both specific biomes and the global ecosystem as a whole is the foundation for every aspect of human existence and activity. At the very least, we need them to produce the oxygen we breathe, absorb the carbon dioxide we exhale, decompose our sewage, provide our food, maintain the fertility of the soil we cultivate⁷. In reality, ecology is the basis for the human economy. The latter is utterly and unavoidably

dependent on the former. Ecosystems and the "services" they provide are not just the "means" of production (i.e. specific resources without which there would be no factories, offices, homes and so forth) but also the conditions for economic and any other human activity. The latter point might become clearer if one compares difficulties of survival on the moon with the habitability of Earth. Like all species, we humans depend on others for our existence.

We similarly depend on certain biogeochemical cycles (water, carbon, nitrogen, etc.) as well as continual inputs of energy⁸. The planet's tree cover highlights what "life-support" means. Forests act as buffers against excess carbon dioxide in the atmosphere and stabilize climate; enhance rainfall; protect soil and act as sponges against excess downhill flow of water. They purify and cool the air; absorb noise; provide habitats for an incredible variety of wildlife; convert solar energy into a host of specific resources of which lumber is just one ... and, to many eyes, they are beautiful. Wetlands provide a further illustration. They are nature's kidneys, processing the nutrients in waterways. Furthermore, they protect shorelines, recharge ground water, moderate flooding and climate whilst, of course, providing habitat for many other species.

Agriculture in South Asia

A sustainable system of farming must be ecologically sound, economically viable, socially responsible, renewable and regenerative and one of synergy - the product of positive relationships⁹. The lessons of sustainability can help inform the choices of human society. We can realize economic gains from appropriate levels of specialization, standardization, and consolidation, but we must do so without sacrificing the social, ecological, and economic benefits of positive relationships at the altar of profit¹⁰. Like any other sphere of human life, ecology conforms to an output rule (waste emission can't exceed assimilative capacity of local environment) and an input rule (harvest rates should be within regenerative rates; and should be below that rate at which renewable substitutes are developed).

Development economics measures success on Gross Domestic Product of the nation, Education and Life-expectancy. Is it sustainable if we allow some forms of capital to deteriorate while others are maintained – a trading off over resources? The world consumption plunges planet Earth into an ecological debt¹¹. Sustainable production and consumption must be socially just and ecologically maintainable. Thus, sustainability could only be explained in terms of four objectives: a) social progress which recognises the needs of everyone; b) effective protection of the environment; c) prudent use of natural resources; and d) maintenance of high and stable levels of economic growth and employment. All bioregions, economies, and societies are inseparable parts of the global ecosystem, global economy, and global culture, which are inseparable parts of the biosphere – the same whole¹². We must learn to make choices, giving due consideration to the whole.

It is not only an option, rather the necessity to choose (bio) diversity, rather than uniformity, recognizing that diversity is necessary to ensure resistance, resilience, regeneration, and sustainability¹³. Loss of diversity inherently leads to loss of form, structure, identity, toward dissipation of matter and energy. We can choose interdependence, rather than dependence or independence, recognizing the mutual benefit to be gained from relationships of choice. But for the unsustainable impact of large-scale, heavily mechanized and chemical-intensive farms, agriculture has changed the face of the earth more than any other technological system, ever since human civilizations started taming the nature some 10,000 years ago.

Technology and Development

Technologically, progress is equated with ever more powerful machines and intricate production systems. Economically, success has been perceived in terms of more and more physical output¹⁴. This worldview is intimately linked to the industrialization of farming and forestry, round-the-clock assembly line manufacturing and, more recently, genetic

engineering¹⁵. Even the building blocks of life are to be made more productive. The connecting thread is an unsustainably narrow concept of efficiency, which in reality is only attained at the unsustainable cost of bigger "inefficiencies", once all human and environmental costs and risks are taken into account.

The current worldview is forged in the technological, economic, intellectual and political upheavals of the British Industrial Revolution and the European Enlightenment (though it was in the new-born USA that "theory" was to be most quickly turned into "practice"). At the heart of this concept of Progress is a mentality of "more-ness" - more people consuming more things, courtesy of more powerful technologies and more control over every aspect of life. Growth, change, development, spending, rapid turnover are all viewed as goods without limits. Anything else is archaic or at best undeveloped, waiting to be developed or 'take off' in the direction of those societies blessed with the widest array of consumer goods and technological devices.

Industrial Metabolism – a paradigm shift?

Energy sources and systems are very important and finite, but the management of both industrial and consumer activities is also a key to the avoidance of unsustainable practices. Ecological concepts are increasingly impregnating areas that keep human civilization going indefinitely - has become a popular and important idea in these areas that appeared to have nothing to do with ecology thus far. Industries these days want to manage their affairs, taking a lesson from nature, so as to minimize direct destruction of resources (for instance, the destruction of forests, agricultural lands and soils).

Engineering corporations, research groups and other entities have been forced developing concepts and operating systems to achieve more sustainable practices for the handling and use of materials and resources¹⁶. These concepts and systems build on a rapidly developing collection of knowledge and practices: life-cycle analysis, "green design",

knowledge about the use of materials in product designs and manufacturing processes. This system is called industrial metabolism (analysis of the flow of materials through the industrial system and into the environment), which relies on the reuse and recycling of subsystems, parts and materials, and the control and elimination of waste materials and pollution.

What is now called "industrial ecology" brings these developments together into a systems view of industry, seen by analogy with natural ecosystems as a collection of industrial organisms organized into a network through which flow energy and used and reused materials, and from which come products and services. We can study material civilization as an ecological network involving industry, consumers and the natural environment. This large-scale systems view illuminates new possibilities for connections in the material and energy web, and new ways to minimize or eliminate environmentally destructive effects of human activities¹⁷.

Human Health and Education

Recent trends in environmental health, ecology and health, and human ecology all suggest that the interface between sustainability, ecosystems, social systems, and health is fertile ground for optimizing environmental health interventions and maximizing public health gain¹⁸. With an accelerated rate of economic development, the substantial increase in the world population and the globalization of trade, these modern realities have dramatically changed production methods and demand for goods in both developed and developing countries, and have become contemporary challenges for disciplines like public health and environmental health. These changes in the way we live and the ever-increasing impacts of human activity on environmental resources and systems highlight an ever-increasing urgency for all to understand that population health is an important part of the concept of sustainability¹⁹.

Accomplishing sustainable social, economic and environmental conditions therefore underpins the achievement of population health²⁰. Further, there are strong arguments for the integration of ecological understanding into formal education and more broadly into life-long learning the values, and skills needed for sustainable living²¹. In this context, universities play a critical role in embedding sustainability principles and understanding in society, through the training of future leaders and professionals, cutting-edge research, and community outreach activities that empower local communities to implement sustainable principles and practices. However, universities currently have a mixed track record when it comes to sustaining the sustainability due to a lack of high-level commitment with little accountability, as well as minimal integration of sustainability into mainstream curriculum.

Ecology in Action in South Asia

Economic and social progress depends on base ecosystem services and a healthy environment. Development also implies an improvement in the quality of life through education, justice, community participation, and recreation. Our simple steps could be initiated at designing in that direction in terms of Policy, Objectives, Targets and Actions. The strategy could have the youth placed at the pivotal centre – from Planning through Execution insured with community liaison. The 35th GC urges Jesuits and all partners engaged in the same mission, particularly the universities and research centre to promote studies and practices focusing on the cause of poverty and question of environments' improvement²².

Strong analytical educational supports, such as those based on systems thinking and practice, could be considerably improved by including creative and practical learning methods observed in ecological processes. There is the need to reinforce the realization that not everyone shares information, definitions, and perspectives, even when ostensibly pursuing similar goals and using identical words.

The program sketched here under is based on certain premises:

- Nature is Divine Creation
- Its Preservation is a Historical Necessity
- Humans as Responsible Stewards of the Creation
- Our existence and evolution is underpinned and balanced by the ecology
- The mission to rejuvenate ecology depends on our ability to interphase with the People/ Communities as a result of institutional outreach.

Objective:

Restoration of Ecology through: 1) Reforestation, 2) Watersheds, and 3) Wilderness

- Teach the students to make a seedlings out of every seasonal fruit they use
- Make forests in campuses – of diverse trees and plants - such that the plantations are not mere shade providers, or avenue ornamentals, rather a maze of mix of fruits-yielding and others. This is to encourage diversity of life forms.
- Each Campus must be a functional watershed - a region of land within which water flows down into a specified body, with Rain Water Harvesting made part of it; along with a drainage basin and a catchments basin.
- Building blueprints are to be drawn such that Water circulation / recycling is taken as a serious service provision.

The following mechanism can be made to one attracting the Government and Policy makers

MECHANISM

Jesuit Institutions & Entities		
Tier I Primary & Secondary Educational	Tier II Tertiary Educational	Tier III Social Organizations
Each Tier adopts cluster of communities		
Student – Community Linkages		
ACTION		ADDED OBJECTIVES
1. Gardens and Herbarium		1. Emergence of Youth Leadership
2. Mass - Plantations		2. Youth Liaise with Community Leaders
3. Rain water harvesting		3. CDM-based Financial Incentives – Related Projects
4. Generation of Seed Banks / repositories of native breeds		4. Conversion into a People’s Movement
Every tree grown is equivalent to a CDM of carbon sink		

CDM = Clean Development Mechanism: expected carbon emission is offset by growing forest trees that removes equivalent carbon

Conclusion

Agenda 21 of the Convention on Biodiversity unambiguously reaffirmed that education was critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. Why is education so important? Education is indispensable in changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving ecological and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development, and for effective public participation in decision-making²³. In addition, as universities are an integral part of the global economy and since they prepare most of the professionals, who develop, manage and teach in society's public, private and non-government institutions, they are uniquely positioned to influence the direction we choose to take as a society²⁴. Therefore, universities have a critical and fundamental obligation for ecology through their teaching, research and outreach activities²⁵. The success of higher education in the twenty-first century will be judged by our ability to put forward a bold agenda that makes ecology and sustainability a cornerstone of academic practice through institutional policy and commitment, operational activities, outreach, and professional development activities.

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