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in Asia and the Pacific

Asia Pacific Perspectives on Environmental Ethics



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ACRONYMS

CBD: Convention on Biological Diversity
CHRB: Convention on Human Rights and Biomedicine
CIOMS: Council for International Organizations of Medical Sciences
COMEST: World Commission on the Ethics of Science and Technology
CSR: Corporate Social Responsibility
GM: Genetically Modified
GRP: Gross Regional Production
ELQ: Environmental life-quality
ELSI: Ethical, Legal and Social Impact
GMOs: Genetically Modified Organisms
IBC: UNESCO International Bioethics Committee
I-O: Input - Output
LMOs: Living Modified Organisms
NGOs: Non-Governmental Organizations
OECD: Organization for Economic Cooperation and Development
RUSHSAP: Regional Unit for Social and Human Sciences in Asia and the Pacific
TS: Transcendental (panspecific) subject
UNESCO : United Nations Educational, Scientific and Cultural Organization

PREFACE

Human beings are one of millions of species alive on the planet Earth, and in our interactions with living organisms and our natural environment we have developed environmental ethics. Article 17 of the Universal Declaration of Bioethics declared by the UNESCO General Conference in 2005 recognised this in the statement:

> "Due regard is to be given to the interconnection between human beings and other forms of life, to the importance of appropriate access and utilization of biological and genetic resouces, to respect for traditional knowledge and to the role of human beings in the protection of the environment, the biosphere and biodiversity."

Without sustaining the environment human beings will not survive. Reflecting this concern, UNESCO has made ethics of science and technology one of its five priority areas. This volume offers perspectives from persons in a range of countries across Asia and the Pacific on environmental ethics, capturing some of the diversity of views and challenges that UNESCO needs to address as it turns increased attention to environmental ethics.

UNESCO's programme in this area aims to strengthen the ethical link between scientific advancement and the cultural, legal, philosophical and religious context in which it occurs. UNESCO's strategy in bioethics has been to act as a standard-setter on emerging ethical issues, to disseminate information and knowledge and to help Member States build their human and institutional capacities. The standards include the Universal Declaration on the Human Genome and Human Rights, adopted by UNESCO's General Conference in 1997 and the Universal Declaration on Bioethics and Human Rights, adopted by UNESCO's 33rd General Conference, in 2005.

This collection of papers is the fourth in a series of books from RUSHSAP[1], UNESCO Bangkok offering Asia-Pacific Perspectives on Ethics, each focusing on specific themes. The contents come from submitted papers to UNESCO Bangkok Bioethics conferences held since 2005, assembled thematically. They also include the discourse from the 2005 conference, as intercultural communication is part of the essence of deliberation on bioethics.

The First UNESCO Bangkok Bioethics Roundtable was held 11-15 September, 2005, as the first event in Bangkok of the 60th anniversary of UNESCO. The UNESCO Bangkok office is the largest UNESCO branch office in the Asia-Pacific Region, which for UNESCO includes 46 member countries from Turkey in the West, to Japan in the East, and New Zealand and 17 Pacific Island nations to the South. It is designated as the regional office for coordinating implementation of UNESCO programmes on ethics of science in Asia and the Pacific with the Division of Ethics of Science and Technology.

In light of the recommendations issued by the World Commission on the Ethics of Science and Technology (COMEST) in December 2006, which noted both the existence of a background consensus on many issues related to environmental ethics and the absence of any commonly accepted or comprehensive framework, future activity in ethics of science and technology will seek to take forward the work of conceptual elaboration, consensus development and capacity building with a strong connection to the relevant intersectoral platforms in reflection on environmental ethics. This volume contributes to the reflection on the issue, and working groups on particular topics have been established in 2007 at the launch conference of the project on Ethics of Energy technologies. Work from that project will be published in a future volume in this series.

In the preparation of this book I wish to thank the active discussion and participation of all the persons

1 www.unescobkk.org/rushsap

who attended the UNESCO Bangkok meetings. A special thank you is due to Silvie Poeth and Daniel Calderbank for help in editing the papers, and to Frankie Keller for transcribing the discussion from the 2005 meeting. The cover design is thanks to Alessandro Blasi and the book text layout was prepared by Celia Thorheim. We look forward to increased discourse on these papers not to be seen as the final word on these topics, but rather as ways to catalyze a greater regional discussion of bioethics and governance of science as applied to the environment according to accepted ethical, legal and social practices.



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Ethical dimensions for sustaining our environment: A Pacific Island perspective*

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Ethics in the Pacific

Ethics is assumed to mean a moral philosophy prescribing what is right and what is wrong. In other words it states how the world ought to be rather than describing how it is. Environmental ethics prescribes what is right because it is good for the environment, which means that it is good for the earth and for creation. What is good for the earth and creation is good for humanity although it may not necessarily follow that what is good for humanity is good for the earth and creation.

When applied in the Pacific context this has to take into account the different world views of Pacific communities that guide them on right and wrong relationships with their environment. An important component of the factors that comprise our identification as different groups of people is the deeply embedded association with the physical place of origin of each of us as a cultural group. As we all know, different cultures reflect different physical environments in which they developed.

While for example the coastal dwellers may develop tools made of fish bones, legends about sharks and turtles, baskets made of beach vegetation and houses made of the ubiquitous coconut and pandanus, inland dwellers may have tools made of wood and stone, legends about snakes and wild pigs, baskets made of tree fibres and houses made of a range of forest species.

Similarly, the attempts that our Pacific societies made in ancient times to explain their relationships with the environment and the meaning of human existence were influenced by their experience and interaction with their natural environment.

Coastal dwellers might revere sharks or turtles as gods while inland dwellers may worship snakes and river dwellers, such as crocodiles. Ancestry may be traced from the union of animal and human or from sacred plants, or from the union of celestial bodies with humans. Whatever the explanation the result was a widespread belief in the sacredness of nature or parts of nature and a close identification with it. An often-quoted example of this close identification is the concept of the land as an all encompassing mother and nurturer embodied in the term Vanua in Fijian, and Whenua in Maori for example. The term Vanua in Fijian embodies the idea that we are an integral part of the land, not separate from it.

Modern science

Such a concept of the earth as the mother and human beings in close relationship with all of nature could provide a sound basis for environmentally sensitive activities for human development. Unfortunately, we have all succumbed to the highly efficient and impressive achievements of modern science and technology which treat nature not as a mother to be respected, but as something separate to be conquered, subdued and exploited. The aim of science as expounded by the great philosopher Francis Bacon is to master nature by following the dictates of the truly natural. To do so is to be devoted to experiment to find out the true nature of things by conquering, subduing and dominating nature [1](Keller, 1985; pp. 36&37).

In modern science nature is something that is observed and described objectively while in our cultural treatment of nature she is described in religious terms with a high degree of subjectivity. For example my village is situated at the end of a small volcanic island close to a deep ocean trench. It used to be

* Paper first presented at the First UNESCO Bangkok Bioethics Roundtable, September, 2005

visited annually by sperm whales. Our people believe there was always one special female whale that came through. She was named *Bui Sena* – conceptualised as an old lady and talked about with respect and considered an integral and valuable member of our sea area. Therefore every member of our community would identify with her. When she did not turn up, she would be missed. To the hardened scientist, the whale was a creature that came north from the colder South Pole Ocean every year to feed and nurture its young in the warmer waters of the Pacific. The whale did not belong to our island sea in particular but travelled the whole Pacific Ocean visiting several national sea areas in the process.

This ability to separate oneself as an autonomous being clearly unrelated to nature according to both Freud and Piaget is *not inborn* but is acquired through our childhood development (Keller, 1985; pp. 80). While this does not necessarily mean that therefore the ability to relate to nature is inborn, it does open the possibility of inculcating closeness to nature through the nurture of our young. It implies that a deep love of nature can be developed in our children through upbringing both at home and in the school system.

Questioning the mechanistic model of nature

There is now growing acceptance particularly with the discoveries of modern quantum physics that scientific observation cannot be entirely objective. With it has developed an increasing acceptance and interest in the work of many geniuses in science who had the courage to go outside the accepted scientific norms. Some of these like Sir Jagadis Chandra Bose of India, Johann Wolfgang von Goethe of Germany, George Washington Carver, Luther Burbank and Cleve Baxter of USA, or Ivan Isidorovich Gunar of Russia all showed through numerous experiments that all life forms have some connection through a force field that enables them to communicate feelings with each other (Tompkins and Bird, 2002).

For example, Cleve Baxter, "America's foremost lie detector examiner" demonstrated that plants could "tell" when a person was lying just as a lie detector would. Plants could read a person's mind. Additionally he also showed through experiments with shrimps that plants react to the feelings of animals. (Tompkins and Bird, 2002; pp.13&14).

Sir Jagadis Bose was a genius far ahead of his time. He was a physicist, physiologist and biophysicist. His prolific experiments showed the ability to communicate or react to external sensations could be detected in both the living and the non-living. In his own words: "In my investigations on the action of forces on matter, I was amazed to find boundary lines vanishing and to discover points of contact emerging between the Living and the non-Living". In view of the numerous demonstrations showed by him and others he goes on to suggest: "...we should abandon all our preconceptions, most of which are afterward found to be absolutely groundless and contrary to facts."

The ability to communicate with plants was the basis of the highly creative activities of both George Washington Carver and Luther Burbank of USA. Carver, called the "Black Leonardo" in his own lifetime because of his amazing creativity, learnt in early life to communicate with both animals and plants using the latter for healing and helping farmers' wives in his countryside to revive sickly pot plants. He went on to turn unproductive cotton fields of Alabama into fertile farmlands through natural technology and to establish the lucrative peanut and sweet potato industry that produced hundreds of different products from "cosmetics and axle grease to printer's ink and coffee.'

Burbank was a genius in plant breeding. Called the "Wizard of Horticulture" his methods baffled the experts. He produced successful varieties of potatoes, fruits, trees, flowers and many others in a small experimental farm with a small staff and in a much shorter period than ordinary breeders took. Both Carver and Burbank treated plants with respect even with love and sometimes talked to them when desperate to communicate.

These great scientists' recognition of the ability of nature to communicate in some way with humans and with each other is closer to the concept of nature held by our forbearers in our ancient societies and denied us by our modern scientific learning.

It is what our Christian upbringing and modern schooling have denied. Unfortunately as a result we are losing our knowledge and our spiritual connection to our land and its resources. The latter has become much more something to be exploited for economic gain rather than something to be treasured for the continuation of scared life. Recognition of our traditional knowledge system will be an acknowledgement of the validity of our ancient wisdom about our environment.

The work and findings of great scientists like those briefly mentioned above confirm our need to re-examine the approach we have to teaching about nature in our modern science disciplines so that we inculcate love and reverence for nature and the environments in our young people rather than the mechanistic model they are currently being taught in schools. This would require a change in the way we popularly conceive of science so that we as children of Mother Earth identify with nature in a subjective way. This requires that we accept nature as having an intrinsic value unrelated to its value to humans. The Earth Charter (Earth Charter International) affirms this in its very first principle which calls us to respect the earth and states in article 1.a) "Recognise that all beings are interdependent and every form of life has value regardless of its worth to human beings."

Ethical dimension of environmental issues in development

The current status of Pacific island countries indicates growing disparity in opportunities and wealth distribution accompanied by increasing poverty. Indeed this trend is global. The link to deepening poverty of resource use and environmental abuse is of particular concern to us in the Pacific. This is because the ethical dimension of environmental abuse is so well illustrated for us by the issue of global warming resulting in accelerated climate change.

Accelerated climate change and its effects are probably the most pressing environmental issues of our time. There is almost universal agreement that global warming is a result of human activities. There are several ethical dimensions associated with the issue as follows: Who is largely responsible? Who bears the brunt? and What are the wider impacts?

A) Who is largely responsible?

As we all know global warming is a result of the build up of greenhouse gasses produced from our activities for transportation, industrial production, intensive agriculture, and tropical deforestation. Scientists inform us that our atmosphere already contains about 25% more carbon dioxide than it has done for at least 160,000 years and continues to build up. More than 80% of the carbon dioxide emission is due to burning fossil energy. Experts project energy consumption to rise nearly 60% due to population growth, continued urbanisation, and economic and industrial expansion between the late 1990s and 2020 (Sawin, 2003).

Energy is a basic input for development. Extreme disparity in development reflects disparity in energy use characterised by striking inequity. It is often quoted for example that one quarter of the world's population that lives in the developed world consumes about 75% of the world's energy while the majority 75% of the world's population in the developing world uses only 25%.

This inequity may be exacerbated by programmed national commitments to reductions in greenhouse gas emissions. A further widening of the economic gap and a deepening in poverty in developing countries could follow. On the other hand, citizens of the developing world see cuts in energy use as threatening their way of life and hard earned standard of living. This fear of deteriorating life styles on both sides is at the heart of the political debate over who should reduce greenhouse gas emissions and by how much.

B) Who bears the brunt?

While government leaders continue to debate and scientists ever more refine their prediction models, poor people all over the world are experiencing the practical impact of climate change. In the Pacific this has been very evident in recent decades with more severe and frequent cyclones, floods, and droughts than ever experienced before.

The poor of our societies are more vulnerable to natural disasters and take longer to recover. In some areas, people have not even recovered from one disaster when another strikes. Of great concern in our region is the threat rising sea levels pose to entire nations. All our atoll nations – Tuvalu, Kiribati and the Marshall Islands face the possibility of total immersion under rising sea levels due to global warming to which their contribution has been quite insignificant. They are victims who can do little to stem the tide. Even now, they are beginning to lose their babai pits to salination. Babai pits are where they grow their staple root crops. Breadfruit trees, another staple source of carbohydrates, are also showing signs of stress as fresh water deposits under the atoll islands contain more saline as the sea level rises.

In natural disasters that gripped global headlines, such as the tsunami in Asia and beyond and hurricane Katrina in Florida, it is the poor that are least able to recover. The world needs to look at this extra dimension of poverty reinforced or even created by vulnerability to natural disasters, which are rendered more destructive by the impact of climate change.

C) What are the wider impacts?

Climate change is only one of many environmental effects of development activities that beset our Pacific region that are detrimental to us, the inhabitants unmatched by any benefits. These include the super powers' use of our region to test their nuclear weapons, the mining of our minerals and precious metals for markets and industries in developed nations, the logging of our forests for use outside our region and the exploitation of our extensive fisheries to feed the hungry world beyond our shores.

Despite the harvest of our substantial resources and the use of our isolated island areas our economies have just about stagnated in the last two decades and the numbers of our poor has multiplied. Environmental degradation for development has called into question for many of our people the issues of justice and equity in development. As we become more integrated into the global economy, gaps in income and well being within our own countries increase along with increasing disparities in the global arena.

Ethical dimension of governance

The equal importance of the environment with social and economic considerations in a just and participatory developing society is not seriously considered in development activities to the detriment of society as a whole. In most discourses on global development the environment is still considered second to social and economic issues. The workings of the WTO, the decisions of OECD and the programmes and policies of the World Bank and the IMF with regard to economic life of the public dominate discussions. The environmental implications of many decisions taken by these bodies are often not taken into account. In the Pacific, local communities own most of the natural resources and are the direct stewards of the environment. Our land is usually communally owned. Our development is still very dependent on the use of our resources including its attraction for tourism. Yet the communal resource owners have little if any input into national policies that direct economic development activities. It is the resource owners who will in the long run impact on the sustainability of any economic development for our nations. Our governance systems, largely top down, need to facilitate the participation of local communities so that their input is considered in programmes that impact on the natural environment. Consideration needs to be taken into account of resource owners' rights as well as the basic human rights of all citizens of each nation in the formulation of sustainable development policies that conserve and respect the natural environment.

Unfortunately modern governance systems in our nations make little allowance for local community input into environmental management mainly because technology for resource use has been largely imported. Local technology developed by the people is little used or promoted often to the detriment of the environment. These local technologies for natural resource use such as fishing methods, agricultural practices, selection of useful plants and animals have been developed by the people over generations of adaptation to the environment with which they have built up close relationships. The destruction of that environment renders the technology and knowledge of the environment useless.

As long as the integrity of the environment is maintained, traditional knowledge and technology for utilising it remain valid and potentially useful. It is through the use of natural resources and their interdependence with elements of the environment that our societies developed an appreciation of the sanctity of nature and recognised its spirituality. Endowing nature with spirituality cannot but hinder its wholesale destruction.

Unfortunately economic factors dominate our leaders' decisions. Cheaper products produced by efficient technologies usurp local products produced by simple local technologies. So it becomes easier to buy rice grown through heavily irrigated and mechanised commercial farming methods in Australia than to buy root vegetables grown locally with the simple digging stick and very little disturbance to the land. It is difficult to compete with products of the modern industrial system that enjoy heavy subsidies in many cases. It has been estimated that worldwide subsidies of at least US$650 billion support logging, mining, oil drilling, livestock grazing, farming, fishing, energy use and driving (Roodman, 1999). Such subsidies encourage wasteful use of inputs in any system. They may preclude the entry into the market of many products of local communities produced through people's technology without heavy subsidies and with gentle use of the environment. Something is wrong with our cost structure that does not take into account the environmental costs of production.

The role of religions

Pacific island people are generally religious. The potentially important role of religion has not been adequately recognised in promoting sustainable development and environmental protection in Pacific island countries. Major religions, including indigenous beliefs, provide moral and ethical guidance for correct relationships amongst communities and between people and nature. Ethics influences resource use and distribution. Religion influences individual's attitudes and behaviour, which can then lead to societal transformation. Most Pacific island countries have adopted Christianity as their major religion although remnants of customary belief systems may prevail. Fiji however also has a substantial proportion of Hindus and followers of Islam with fewer followers of the Bahai Faith and of Buddhism.

Christianity has largely been dominated and interpreted by men so that it has supported the modern scientific and technology approach of domination of nature for the good of humankind. With the realisation that domination has led to the destruction of our environment, Christian thinkers have swung away from the notion of domination to the teaching of stewardship. Even with the concept of stewardship there is still some element of power retained by the steward over the earth, so that Christian theologians continue to look for interpretations that would foster care and reverence for the environment.

The great religions of the East – Hinduism and Buddhism – for example, have a reverence of life firmly based on the belief that we as humans are an integral part of a common fabric of nature closely interacting and interconnected as one reality. The majority of religions promote living simply with the minimum levels of consumption in the interests of individual spiritual development and for the welfare of society where individual want is abolished through equitable sharing of the products of development.

Major religions have a strong interest in curbing excess consumption. This is possible through integrating spiritual and material development out of which emerges an ethic of consumption that encourages a simple lifestyle and concern for the need of others. A good example of the integration of spiritual values with development is the work of the Sarvodayan movement in Sri Lanka (Gardner, 2003; pp. 168-169). The vision of development for this movement includes not only the material benefits but also the educational, social, cultural and spiritual requirements. The movement's ethic of consumption is accompanied by an emphasis on sharing which results in strong community cohesion. The Sarvodayan movement had grown to cover more than half of Sri Lanka's 24,000 villages.

Religious bodies have important roles to play in influencing people to consider their lifestyle choices carefully. Many are already involved in programmes that promote fair trade as well as conserve the environment. The role of the religious bodies in education and raising awareness of people on environmental issues associated with development and economic growth is potentially enormous and as yet little tapped.

Conclusion

It is clear that humanity cannot continue to exploit nature for the range of human demands without destroying irreversibly the environment that sustains life. We can no longer deny our spiritual relationship with nature that so many brilliant scientists have demonstrated. This relationship also links us one to another in a web that compels us to limit our demands and to consider the needs of others. It compels us who are privileged to live more simply so that many more others may simply live.

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Land and people as the measure: A Pacific ethic of place and prudence*

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In his book The Fate of Place: a Philosophical History, Edward Casey illustrates how much of Western liberal philosophy has come to "dissolve place into space" (Casey 2:3). This "triumph of space over place", Casey argues (2:4), has led to the disappearance of the idea and importance of place and to the subsequent "supremacy of site" (10). The "modern…placeless subject" is consequently located in sites (a "space of domination") which Casey describes as the antithesis of place. If place is where one "stands up",[1] where bodies are sustained and supported, [2] sites are where place is dismantled and subjects are confined and objectified.

In Pacific philosophy, place (or land)[3] is supremely important. It signifies who people are, how they interact with the environment and with each other. It forms an ethical basis upon which community and people's thoughts and actions are guided. Place and by extension land, are where people stand up, where they can speak and act, where they are truly at home.

Western influence in the Pacific has largely been unsuccessful at replacing place-based with space-based thinking, in spite of the legacies of colonialism and neo-colonialism. However, much of development and governance policy in the Pacific, which is mainly forged by donors and multilateral banks and agencies, is driven by a universalist rationalism which denies the importance of place in favour of space and of the creation of sites such as plantations, mines, hotels, factories etc. where people can be displaced and objectified. The emphasis on space leads not only to viewing development in terms of the creation or exploitation of sites but also to disregarding the environmental impact of development. Thinking in terms of place or vanua, fonua, fanua, whenua, te aba where both the land and the people are intimately related, in contrast leads to a view of development as the joint welfare of the land (including the ocean) and the people. It offers an alternative paradigm to dominant modes of governance and development. It also offers parallels with the ethics of place put forward by more recent environmental philosophers.

This paper briefly examines the theoretical underpinnings which have led to the replacement of place by space in Western liberal thought before examining Pacific thinking about place. It then develops the specific nature of the Pacific ethic of land or place and relates this to contemporary (Western) environmental philosophy on place-based ethics. It concludes by suggesting that place-centredness should be valued more highly by policy makers in the region through appropriate development and governance policy.

Absorbing place into space

The notion that "space" as opposed to "place" is the more appropriate basis for philosophical thought has been the hallmark of Western rationality since the so-called Enlightenment period. This situation is fairly recent in origin but has become dominant. In contrast, ancient philosophers like Aristotle valued the idea of place over space (Casey, 2005; pp. 2-3). And the idea of place in most medieval societies was associated with "sacredness" as opposed to space which was always linked with the "profane" (Eliade, 1987; pp. 166-171).

* Paper first presented at the First UNESCO Bangkok Bioethics Roundtable, September, 2005

1 See Mead (2001:272).
2 Casey writes: "In one of the most extraordinary statements of platial power ever made in the West, Iamblichus proclaims that this power consists in "sustaining and supporting bodies, raising up the falling ones and gathering together the scattered ones, filling them up as well as encompassing them from every side" (2:5).
3 Place and land are interchangeable in many Pacific languages. See below for further clarification.

The Enlightenment, in heralding the advent of Modernity, the fluidity of which Marx immortalised in the words "All that is Solid melts into Air", trumpeted the subjugation of "place" and the emphasis on "space" which subsequently became an intrinsic part of Western thought. The Enlightenment was a period of profound changes and uncertainties as Marx observed in the Communist Manifesto:

> All fixed, fast-frozen relationships, with their train of ancient and venerable prejudices and opinions, are swept away, all new-formed ones become antiquated before they can ossify… (in Tucker R. 1978; p. 46).

To comprehend this change one has to look back at the way pre-modern thought processes in Europe had evolved in the interstice just prior to the Enlightenment. The "world in pre-modern was generally understood to be a vertically…stratified and bounded cosmos" (Sachs, 1999; p. 103). This stratification pattern served to distinguish between nature and the heavens. The relationship between the qualitatively different realms of the physical and that of the spiritual was the main preoccupation of medieval scholarship. This vertical relationship gradually flattened out in the beginning of the modern period. The change was influenced by the transition from a knowledge base that revolved around the idea of a supreme being living in the heavens to one that is based on science. What became important then was not so much the perpendicular view that focused thinking to the heavens as the horizontal view into the distance. Wolfgang Sachs (ibid) noted that, "[a]s the vertical dimension faltered, so the idea of qualitative differences between the lower and upper layers of reality also faded away and was replaced by a homogenous reality…" – space. Furthermore, "…the abolition of the stratified cosmos has made possible the rise of 'space' to its prominent position in modern consciousness. And the rise of space-centred perception has made it possible to conceive of "one world".

With this advent of a new "geography of modernity" came an overarching emphasis on man. For Smith, "Modernism marks the apogee of [an] anthropic instumentalization of space as everything and everywhere becomes disenchanted and profane and the world is opened up to exploitation." Modernity's horizontal perspective has sought to erase all differences between places reducing the latter to 'mere coordinates within homogeneous space" (2001; p. 209). In doing so it has consistently unravelled (or tried to unravel) the intricate bonds between place and people which existed in pre-modern societies.

The appeal to "space" in the Enlightenment mind is understandable: space is limitless; it is infinite. Space is Universal. Indeed the quest for universality meant that the Enlightenment discourses had to emphasise the "non local" and the "non particular"[4] (Casey, 2005). In so doing, scholars of the period erased from *modern* sensibilities the works of the ancient philosophers that acknowledge the existence of "place". In this way the appeal of non-contexualised paradigms grew. Hence the invocation of space (as opposed to place)[5] has amongst other things made possible universal validity-claims of Western philosophical discourses. It is within this philosophical space that the Cartesian subject gained autonomous will. "Space" then became the hunting ground of the subject in *his* attempt to recreate the universe in his own image.

The teleological thrust of the coupling of "space" and the philosophy of consciousness has led to the objectification of what Wolfgang Sachs (1999; p. 37) termed "the global commons": the Antarctic, ocean beds and tropical forests. For Sachs (*ibid*) the precarious position of our natural environment stems from the adoption of subject-centred reason by other non-western societies. This specific technique of rationalisation was transported and entrenched around the globe through "…trade, colonialism…the spread of industrialisation and the market economy" (Apffel-Marglin and Marglin, 2004; p. 11).

4 This was tied to a period of European expansion and "discovery" of the rest of the world, and to the destruction of the old feudal systems in Europe.

5 Sheldrake (1996; p. 258), quoted in Brady (1999; p. 143), defines the difference between space and place in the following manner: "Space is our experience of three-dimensional extension or the linear extension between a number of fixed point. This does not make space a completely empty or meaningless void, but its own mere extension has no specific definition. On the other hand, "place", while certainly involving "space" implies a great deal more than mere extension or distance. It is a locus, a location, a portion of space with particular significance. "Places" are relational, connected with people, either because they are occupied by them or because they reflect something of human significance. Places have a position in the sense of both location and of moral value. To "know your place" implies a sense of identity within a wider framework of people, values or structure."

In the *Dialectic of Enlightenment,* two Frankfurt Scholars lamented the consequences of the instrumentality of reason resulting in the ossification of social relations between humans and with their natural environment (Horkheimer and Adorno, 1947/2002). These authors argue that one of the main objectives behind the Enlightenment movement is the liberation of humankind from "the fear of the unknown", and that the means to do this is to instil in humans a particular kind of thought process that will enable them to master and therefore control the unknown or the *other*. The creation of a dichotomy between the *subject* and its *other* facilitated the emergence of conceptual thought that later crystallised into instrumental reason[6].

Over time this controlling attitude has been directed towards both humans and the environment with disastrous consequences as exemplified by colonial genocides, the Holocaust in World War Two and myriad examples of environmental degradation. This prompted Horkheimer and Adorno to comment that "…mankind, instead of entering into a truly human condition is sinking into a new kind of barbarism (ibid: xiv)". In light of the above failure of instrumental rationality to liberate humanity from its "pre-modern" shackles, both theorists put forward the view that Enlightenment reason is mass deception. This suggests the extent to which subject-centred reason is implicated in the catastrophes in both the social and natural world. In light of the above, the crisis of the environment can be can be attributed directly to the "irrationalities" embedded within a subject (and/or human)-centred reason and a space-based perspective.

It is within this context that current (and older) attempts, in the Pacific and beyond, to reinvigorate placed-based rationalities and their ethical dimensions are situated.

Place-based philosophical traditions in the Pacific

The philosophical configurations that arise from the processes of signification inherent within the indigenous cultures of the South Pacific are different from those evinced by the West. These processes such as identity formation and knowledge production are derived from the land or place. As such they do not presuppose the existence of an autonomous will as Western traditions do. The idea of "place" is central in the Pacific and is articulated through the use of concepts like *vanua* (Fiji), *whenua* (Aotearoa), *fonua* (Tonga), *fanua* (Samoa), *fenua* (Maohi Nui/Tahitian), *fanoa* (West Kwara'ae, Malaita), and *te aba* (Kiribati).

The different descriptive nouns outlined above all mean "land" in their literal sense. However they also have a phenomenological dimension in that they "…are built through the mediation of communicative experience" (Delanty and Strydom, 2003; p. 92) or what Anthony Giddens has referred to as the "double hermeneutic". This alludes to how a place has always been embedded within a matrix of social relationships that is the product of the consensus on normative standards and interpretation of what is "real" by the individuals concerned via interactive exchanges.

Mead (2003; p. 269) for instance reminds us that *whenua* "also means placenta", "ground", "country" and "state". He observes that within Maori communities, the land plays a pivotal role in the socialisation process. It becomes the basis of Maori worldviews, "…the centre of their universe and the basis of their identity as citizens or as members of a social unit" (2003; p. 271). In her research on Hawaiian epistemology Meyer describes "*aina* [land] as origin… as mother… as inspiration". She adds that, in her interviews, "It was the *place* of birth (*aina hānau*) where all mentors began their descriptions of who they were, and how it shaped their differences and values" (1999; p.128). Ilaitia Tuwere (2002) similarly refers to the land as "provider", mother and nurturer in his discourse on *vanua* in the Fijian context. Māhina (1999a; p. 282), quoted in Ka'ili (2005; p. 93) writes, "… In Tonga… the mother's 'placenta', 'land' and one's grave are all called *fonua*. That is, that one is born out of a *fonua* into a *fonua*, who, upon death, enters another *fonua*…. Upon birth, the new born,… living in society, continues to receive nourishment, this time from the land and its people, until death, when the body returns… to the land in the form of *efuefu* "dust" and *kelekele* "earth", which in turn, continues the nourishment of the living and awaits the sustenance of generations yet to come".

6 Needless to say this mode of reasoning has led to the marginalisation of other forms of "knowing" and "doing".

Similarly, in Kiribati, "*te aba*, is where people start from and end… It is more than just land; it is the most important possession... *Te aba* means both land and people, and is interchangeable with *aomata* (people)… In Kiribati, when one speaks of one's land, one refers to it as *abau* using the suffix u as a possessive form, just as one uses it for one's hand (*baiu*) or one's eyes (*matau*) or ones' children (*natiu*)"[7] (Teaero, 2005a). Land is therefore an integral part of all I-Kiribati. These examples from different communities underline the centrality of place or land (for want of a better word) in the lives of the inhabitants of the Pacific. Mary Graham (2005; p. 2) puts it succinctly when she says that from an aboriginal perspective "…the relation between people and land becomes the template for society and social relations. Therefore all meaning comes from land".

The above marks the major point of discontinuity between the subject (or human)-centred philosophical traditions of the West and the contexualised or placed-based traditions of the Pacific. For the former meaning and understanding comes from human rationality, i.e. the ability of humans to think or reason above and beyond their bodies, their environment and other beings which surround them (ancestors, spirits, fauna and flora).[8] For the latter, "land" is place, thus it is always bounded through various social mechanisms. To talk about place or *vanua* with no boundaries is impossible. It would be akin to the "… unimaginable "infinity of space"' (Kanahele, 1986; p. 176).

This would be the natural conclusion of the indigenous people of this region when sensitised to the *uncharted* (and non-relational) spaces and the perspectives that these spaces have spawned in the West and which have subsequently been 'peddled' around the world. Pacific Islanders would deem these space-based views as problematic by arguing that an uncharted and non-relational space is a non-identity and as such is meaningless. It has to be bounded or delimited to give it a sense of certainty. Yet in spite of its "boundedness", land for indigenous cultures in the South Pacific, like a mother, cannot be possessed. Instead social groups form specific relationships with the land that will ensure survival of both. This order of things is sacrosanct for indigenous cultures. That is, land without the people is "empty" while people without their land are "rootless".

In indigenous Fijian society, one's being and therefore identity is derived from the *vanua* or place one 'springs from. The *vanua* is the progenitor. One is born, moulded and nurtured within the confines of the *vanua* and one is ultimately subject to it.

This is to say that a person's place is defined. Similar processes are found in other cultures in the South Pacific. Mead (2001; p. 283) notes that "[T]he land is a source of identity for Maori". For Kanahele (1986) the roots of identity and self esteem of a Hawaiian are moored in a place. For example, all important proceedings in a person's life-cycle

> …from birth to growing up…his initiation into the *hale mua* and the rights of manhood, his learning and practicing of a trade, his sexual encounters, marriage and raising up of a family, his labour, sacrifices and achievements- occurred in one place…Thus his attitude, instincts, perceptions, feelings and values were shaped and moulded by that place. (*ibid*; p. 181)

In the Fijian context the yavu perhaps best encapsulates the vanua-centred nature of identity formation processes in indigenous society. A yavu is a mound of earth on which one builds a house in one's village. One and one's descendents will hereafter be known by one's fellow villagers by the yavu one hails from. A yavu therefore is the basic family unit. Extended family units lead to a bigger social unit called the tokatoka; a given number of tokatoka leads to the formation of a mataqali and several mataqali lead to a yavusa. A vanua usually contains several yavusa. You are known by the Vanua you hail from. In your vanua, you are identified by your yavusa and mataqali. In the village, the mataqali and the tokatoka are usually used for identification purposes. But all this is premised on a distinct area that is your yavu or home.

7 This is in contrast to the possessive pronoun of au (my) which is generally used for nouns.

8 As Val Plumwood notes: "The idea that the larger world is meaningless and that only the human, the controlled and intended, can ever be meaningful is part of Enlightenment rationality, a part freeing us from what it called "superstition" but also cutting us off from enchantment and from certain important kinds of openness to chaos and wonder at the world" (2002; p. 227).

The point here is that, as one goes up the social structure from the yavu, one ventures increasingly into the realm of different places and relational spaces. These relational spaces are not vacuums as in the idea of "absolute" space in Western philosophy;[9] instead these spaces have been charted and are bounded by the notion of place. Indeed space in this schema would simply mean an enlarged place which abounds with social interactions.

The Hawaiians were also known for "creating places" by delimiting space. According to Kanahele (1986; p. 176) these spatial demarcations were done through the "…drawing [of] imaginary lines on land, across the ocean and upward through the atmosphere". Their cardinal reference points were fixed by the rising and setting positions of the sun as well as that of the North Star. In Fiji, charted spaces have defined the boundaries of customary fishing areas, land and the legitimate sovereignty of the vanua. Under the rubric of charted spaces one may also include the study of personal or "body spaces" (proxemics) and their interactive significance in everyday life. According to Kanahele (1986) personal space is the "area with invisible boundaries surrounding a person's body (p. 194). In an interactive exchange, perception of these spaces by the participants often influence the way they behave towards each other. Their "body language" is really the space between them[10] since the space is rendered meaningful only via the symbols emanating from the body.

The discussion above highlights how space, in indigenous cultures of the Pacific, has generally been conceptualised from within place-centred perspectives. As such, the notion of space cannot be that of a vacuum as in a Western sense, but is charted. Charted spaces require a certain degree of consent and active co-operation from all those concerned in sustaining them, hence the spaces become a conduit to the way people relate to each other or what Tevita Ka 'ili referred to as 'sociospatial connection". The notion of va in Tongan, Samoan, Rotuman and in Tahiti refers to the "spaces between people or things" (2005; p. 89). That is, space in the Pacific is generally defined as relational space.

In Kiribati navigators[11] use the notion of the shifting centre, ebua tebuto (shifting navel) to conceptualise their movement within space (or between places). The shifting centre is the place where one stands or is situated at any one time; therefore the place or centre shifts in space with one's movement. One therefore becomes indistinguishable from the place one occupies. At any given time, the navigator is in a particular place and in order for him/her to understand and interpret the signs which surround him/her, he/she must acknowledge the place he/she is in.[12] In other words, place is central to understanding one's position and to being able to navigate in space to other places. The particular (place) rather than the undefined space is key to efficient movement (Teaero, 2005a).[13]

David Gegeo offers another understanding of space in Kwara'ae: space is equated with "location", that is where a particular person may be at any one time: once a person moves on this 'space' can be filled by someone else. But more importantly, he adds that "because of the possibility of space" (ie changing locations) "a person can be anywhere and still be inextricably tied to place". He concludes, "Place is portable… 'it is in our blood' " (2001a; p. 495). Thus while space is "changeable", place is an inherent part of what it means to be Kwara'ae.

9 For a discussion on absolute and relational space, see Smith, 2001:210

10 This is different from saying that the space between the participants is the conduit for their body language

11 This information is based on a skilled navigator passing on of knowledge to Teweiariki Teaero, a USP academic, who has in turn has spoken about these ideas in a graduate course at USP. See Teaero, 2005a.

12 In Kiribatese there is no gender distinction as in he/she. But most navigators have traditionally been men with the exception of at least one famous woman navigator, Nei Nim'anoa. See Teaero, 2005b.

13 A similar idea, described by Diaz and Kauanui (2001; p. 317), exists in the Carolinian seafaring technique of etak, "a form of triangulation". "As David Lewis once remarked, in traditional seafaring one got the sense that the canoe was stationary while islands came and went (1970). As a technique for successful travel, whose most urgent stakes are the peoples' survival and stewardship of place, triangulating among moving islands in a fluidic pathway involves a clear and unambiguous sense of one's place at all times. The islands may move, but one must always know their location at any given time, as indexed by their signs in the natural and supernatural worlds. To lose one's place, to not know where one's island is, or to no longer be possessed by that island, is to be perilously lost at sea".

Reasserting place-based ethics in the Pacific

"The Land has Eyes and sees the truth"

Vilsoni Hereniko (Producer of "The Land has Eyes")

In theorising aboriginal world views, Mary Graham (2005) identifies certain lacunae within modern discursive methods. This, to her, has been typified by the Western practice of simultaneously embracing two diametrical viewpoints that sought to, on one hand, preserve social equilibrium via the ordering of stable patterns of social relations between people and with their land and, on the other hand, encourage creativity that is increasingly regulated by technological rationality which in the end objectifies society.

Of course these seemingly basic drives are perceived to be antithetical only from a place-based perspective. The only way it was possible for the Western psyche to harbour both tendencies for any duration of time at all is to let the objectification process be mediated by subject-centred reason.

The point however is the subjugation of aboriginal perspectives has resulted in the marginalisation of their place-based sociality. This in turn has resulted in the negation of both their collective spirit and the sanctity of their land. That is, the deconstruction of 'traditional' systems of knowledge and the demystification of their belief system via the use of 'instrumental reason' or scientific rationality leaves a vacuum for the inculcation of rationalised life systems into the aboriginal life-world.

Max Weber noted this form of pathology in the West by pointing out that within this form of social regression, zombies, lethargic in both heart and spirit, are created. The marginalisation process has left many Aborigines disoriented and 'rootless'. Indeed the domination of the idea of space in the Australian context led to the legal affirmation of terra nullius thereby undoing Aboriginal affirmation of place.14 This process led to the creation of "sites" such as aboriginal reserves which were locations of social, political and economic disempowerment.

As Mary Graham reminds us, Aboriginal identity (as is generally the case for other Pacific indigenous communities) is derived from place. Aboriginal ways of "knowing" and "acting" or signifying practices are predicated on peoples' relationship with land. Norms, values, mores and folkways are an ethical reflection of the web of relationships between humans and with their places. To lose one's land is to be homeless; to preserve one's home and thus identity is to nurture the land. The notion of people as custodians rather than owners of the land is a preservation mechanism that allows for the nurturing of the land and the sustenance of communal identity. Mead (2001; p. 283) wrote that within Maori culture:

> [t]he living generation act as the guardians of the land, like their tupuna had before them. Their uri benefit from that guardianship because the land holds the link to their parents, grandparents and tupuna, and the land is the link to future generations. Hence, the land was shared between the dead, the living and the unborn.

There are various dimensions contained within the Pacific ethic of land or place as we shall see below. Among them are the obligation to respect the land and its people, to listen to the land, to recognise the rights inherent to those of the place, and to value all that is contained in the place, human, non-human, ancestors, etc. For instance, in the Fijian context, Tuwere (2002; p. 31, 73) draws out the ethical dimension of vanua in terms like veirogorogoci (mutual listening), veivakarokorokotaki (mutual respect), veivakaliuci (regarding the other as higher in rank), vakanomodi (silence) and sala vakavanua (the path of the land). The emphasis on mutual listening seeks to ensure that people are in communion with each other.

The focus on mutual respect is deemed to foster the preservation of group integrity and the sanctity

14 Veronica Brady's citation in the Australian settler context of "Marcus Clark's well-known introduction to the Poems of Adam Lindsay Gordon, 'a land… [with] no past, no story' " illustrate the European's difficulty to grasp the history of the place the settlers were "conquering".

of the *vanua*. *Veivakaliuci* is deference to the *vanua*. Silence is deemed to beget reflective wisdom. And collectively they point to the path of the land which in the final analysis, has been, is and will always be the "right" way. This shows the extent to which an ethic of place or land is potentially empowering in the sense that it leaves no one out. If all belong to the land in a mutual relationship, then land will provide for all.

The concept of *tūrangawaewae* in Maori culture also epitomises this holistic relationship between the land and its people, and the rights derived there from: "Land provides a place for one to stand…, a place for the feet to stand; where one's rights are not challenged, where one feels secure and at home" (Mead, 2001; p. 272). This "right" to stand confers dignity on all as a member of the land and of a place. It also implies that those not from the place should show respect for those of the place by recognising their rights.

This understanding of place is also drawn out by Gegeo (2001a; p. 495) in the Kwara'ae context: "… place means the unquestioned position, based on genealogy and marriage, from which one may speak to important issues in Kwara'ae without being challenged about identity or the right to engage in dialogue, such as during a communal meeting". This inevitably has strong ethical implications: "place is accompanied by certain kin obligations and responsibilities that cannot go unfulfilled, and from which one is freed only by death". The responsibilities are many and include "contributing to bride price or bride wealth payments in marriages, uniting with one's kin group in times of land or other major disputes and for communal projects, and contributing food and other necessities to the family of a kin member who dies".

Mary Graham discussing the Aboriginal context, argues that "over vast periods of time, Aboriginal people invested most of their creative energy in trying to understand what makes it possible for people to act purposively, or to put it another way, what is it exactly that makes us human?" This fundamental ethical question is answered through the understanding or acknowledgement that "humans are not alone". That "they are connected and made by way of relationships with a wide range of beings, and it is thus of prime importance to maintain and strengthen these relationships". This understanding is expressed through what she terms the "custodial ethic toward land" (1999; p. 111-2). This ethic (like many other ethical systems) requires commitment and reinforcement but at its heart lies the understanding that relations between humans, other creatures, ancestors and the land are the foundation to well being:

> "The custodial ethic is achieved through repetitive action, such that gradually, over time, the ethic becomes the 'norm'. For Aboriginal people, the land is the great teacher; it not only teaches us how to relate to it, but to each other; it suggests a notion of caring for something outside ourselves, something that is in and of nature and that will exist for all time. Every Aboriginal person had a place at some intersection within the kinship network which extended over the whole of Australia, and every intersection within that grid was anchored, eternally, to some point on the landscape by the relationship to Creator Being ancestors".

The custodial ethic, in which sharing and caring for the land and others is valued, is "primarily an obligatory system". This is also the case in Hawai'i where the concept of *mālama 'aina* (to take care of the land) also asserts a custodial ethic of land and place, in which reciprocity between the people and the land is a central feature. Kame'eleihiwa (quoted in Ka'ili, 2005; p. 94) wrote that "it is the duty of Hawaiians to *Mālama 'Āina,* and as a result of this proper behaviour, the '*Āina* will *mālama* Hawaiians" (1992; p. 25).

Meyer further explains that land operates as a primary reference point from which knowledge and behaviour derive. This is because Hawai'ians recognise land as that which "feeds" both literally and spiritually. The connection between "*Hāloa*, the taro and 'first man'" (ie the genealogical link between the progenitor of Hawai'ians, *Hāloa*, and all Hawai'ians) demonstrates the closeness between everything which emanates from the land. Planting with care is literally and metaphorical a way to *mālama 'aina* as "plants, specifically taro, imbue the *ohana* [family] with continuity of place and people, and their world with relationship" (2003; p. 98).

While value is placed on people, the relationship with the plant world as well as with the rest of the environment, lead to a strong connection to the latter: "Taro as a metaphor for a person, or qualities

of behaviour is just one example of how Hawaiians linked ourselves to our natural and cultivated environment. This connection with environment and family is also depicted in the notions of 'aumākua and kuumupa'a (ancestral deities). ('Āumakua took the form of animals, plants, fish, wind, etc.)" (2003; p. 100).

In the Pacific it is in and through the land that people derive their ethical understandings because it is within the land that wisdom, *mana*, understanding and creativity are found. As we have seen it is the land which feeds the people, literally and figuratively. The land (and by extension the sea/ocean) is the source, the foundation of all the rest. Central to this idea of land, *whenua, vanua,' aina* etc being the foundational ethical reference point is the perception that land is alive because it produces and creates – it is not an inanimate commodity. As Gegeo states in the Solomon Island (West Kwara'ae) context: "Anything born of the land and passed from generation to generation is part of *kastom*" (2001; p. 59). In other words the land is what gives life not only to people but to culture, to custom. As a result, one always has a duty to return to the land, to one's place: "One's life is unfinished until one completes the cycle by returning to clan-held land, the village, and one's true foundation in *falafala* (culture)". Every person has a place to which they are entitled to return and no-one should ever find themselves "placeless": "Kwara'ae people living in Honiara, even those born there, speak of returning "to the house (*luma*)" when referring to where they are currently living. "Going home (*fanoa*)," on the other hand, refers exclusively to one's village, even for those who were not born on Malaita; they still have land rights and a village identity through their patrilineal or matrilineal kin, or both" (1998; p. 294).

The land is loved and respected because it is deemed a source of wisdom and truth. This is the idea put forward by Logovae in his analysis of the Samoan concept of *fa'autaga* (wisdom between *matai*) which draws on the idea that wisdom is "deeply embedded in the land" and "is a gift from the land" (Logovae, 1982; pp. 13,15, quoted in Huffer and Qalo, 2004; p. 94). The same idea is put forward by Hereniko in his film "The Land has Eyes" in which he shows that "Rotumans believe the land has eyes and teeth". He explains: "This is central to the Rotuman belief about justice and whenever the western court is unable to deliver it, the land would"; and adds, "It [the land] is vigilant and knows the truth and will haunt people who claim boundaries that do not belong to them. This is important to all indigenous cultures because without the land, what else is there?" (*Fiji Times*, Sep. 10 2005; p. 7).

The Pacific ethic of land or place provides a strong consciousness that going against the path or the way of the land, for instance lying crooked on it *davo cala* as opposed to *davo donu* (lying straight in Fijian) will lead to the end of *sautu* (well being). The path of the land (*sala vakavanua* in Fijian - ie how to do things) is itself closely tied to the idea of routes or networks, which are in turn closely tied to genealogies and relationships – there are ways to advance or to move towards an end – the movement must not be abrupt, and it is multidirectional. It doesn't seek to overcome or conquer space but rather to move from place to place, carefully. It is what the Kanaks call (in French) *les chemins de la coutume* (the ways or paths of custom).

This is exemplified by Mead's description of how ethical dilemmas can be approached (even if they cannot always be definitively resolved) using a Maori framework. It is a step by step approach, gradual and cautious. And there is a right way to proceed – this is contained in the expression *Tikanga Maori* which refers to the Maori way – or Maori customary values and practices (2003; p. 5).

More specifically, according to Mead, "*tikanga* is the set of beliefs associated with practices and procedures to be followed in conducting the affairs of a group or an individual (2003; p. 12). "'*Tika* means 'to be right' and thus *tikanga* Maori focuses on the correct way of doing something" (2003; p. 6). Mead describes the successive tests or standards against which an ethical dilemma or issue can be measured. He lists them as "Test 1: the *tapu* aspect" (337), "Test 2: the *mauri* aspect" (338), the "Test 3: the *take-utu-ea*" (341), "Test 4: the precedent aspect" (343), and, "Test 5: the principles aspect" (344) which includes 5 areas: *whanaungatanga*, *manaakitanga*, *mana*, *noa*, *tika* (350). Without going into detail about each of these standards, the point to understand is that they are ethical markers which allow for careful consideration and deliberation of complicated matters. They are the markers of the paths of the *tangata whenua* (the people of the land).

Valuing the land and one's place naturally leads to an ethic of precaution or prudence in which careful thought must be given to new developments. It is not always easy or possible for Pacific communities to

protect their environment and way of life in the face of increasing pressures for resource exploitation.

Pacific communities have at times irreversible damaged their land and environment – in the past animal species and forests have been wiped out, and today many communities are finding it difficult to resist or counter extractive behaviour but their bond with land and place provides an ethical standpoint from which to address challenges. In addition, although Pacific cultures value people highly they do not place them above the land simply because the people are the land, and seek to remain so. Their understanding of land and place is consistent with contemporary environmental philosophers who advocate for an ethic of place and land. The latter seek to promote a move away from a human/subject-centred understanding of the world to one in which humans value the environment and give greater value to other beings and place/land. As we shall see there are clear synergies between what they advocate and a Pacific ethic of place.

The Ethic of land and place and contemporary environmental philosophy

A number of Western environmental thinkers and philosophers, concerned with how humans have been treating the earth, land and other species have advocated for a land ethic as well as an ethics of place. The most prominent, early Western voice for a land ethic was Aldo Leopold, a conservationist and scientist, who developed his ideas in the United States towards the middle of the 20th century, in his A Sand County Almanac.

Leopold advocated for a land ethic as a way to shift ethics away from its concern with relations between individuals to a wider caring for the "biotic" community, i.e. "the land and the animals and plants which grow upon it". As he described it: "In short, a land ethic changes the role of Homo Sapiens from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such." Leopold considered a land ethic to be both "an ecological necessity" and "an evolutionary possibility"[15].

He envisioned it as a means for reformulating human attitudes to land progressing from a "strictly economic" relation "entailing privileges but no obligations" to an understanding of land as an integral part of the community of which humans are a part. "All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in that community, but his ethics prompt him also to cooperate (perhaps in order that there may be a place to compete for). The land ethic simply enlarges the boundaries of the community to include soils, water, plants, and animals, or collectively: the land".

Although Leopold's ideas were clearly developed in the context of mainstream American ethical understandings,[16] they resonate with Mary Graham's writing on the custodial ethic of Aboriginal peoples toward land. In what she calls the "reflective motive", she explains that Aboriginal society deliberately inculcates ethical attitudes towards all others and land: "The non-ego based nature of Aboriginal society was grounded in an understanding of the human psyche. The Aboriginal understanding posits that the tendency to possess is more deeply embedded in the human psyche than is the tendency to share. In other words, possessiveness is a more "primitive" mode of behaviour than sharing or altruism: possessiveness precedes altruism and it therefore takes a higher order of abilities to maintain "sharing" behaviour than it takes to demonstrate possessive behaviour. Possessive behaviour is asserted or exhibited spontaneously and unreflectively. Sharing behaviour has to be inculcated in the first place and then "maintained". It involves such abstract concepts as "reciprocity", "strategy" and above all "community" (1999; p. 112).

Mary Graham reminds us that ethics are learnt through socialisation and that the kinds of ethics we

15 See http://www.tipiglen.dircon.co.uk/landethic.html (accessed July 2005) for Aldo Leopold's chapter on The Land Ethic in A Sand County Almanac, 1948. All quotes are from above web posting, pp. 2, 4, 6, 7 and 12.

16 It is ironic that Leopold viewed the land ethic as an "evolutionary possibility" when Native American communities had been practising that very same ethic in the land he was writing about for hundreds of years before the arrival of immigrants from Europe.

adhere to as a society depend on what we learn and teach our children; and what we decide is important in particular contexts. Sharing and caring for the land, i.e. establishing and maintaining an ethic of place or of land, may well be less gratifying and less rewarding in the short term than upholding an ethical system that ranks humans higher than the land or non-human species; and that favours human "pleasure" over other considerations.

This leads us to the question posed by Leopold on the content of what he called "conservation education". He wrote: "The usual answer to this dilemma [the slow pace of conservation] is "more conservation education". No one will debate this, but is it certain that only the volume of education needs stepping up? Is something lacking in the content as well?" While Leopold was referring to American society in the mid-20th century, his concern is applicable to the region today.

A similar question needs to be asked of education in the Pacific which is essentially geared to removing people from the land and does little at present to encourage Pacific ethical understandings of land and community. When decisions are being made about introducing civics and values (or ethics) education, will the focus be to "obey the law, vote right, join some organizations, and practice what conservation is profitable on your own land…"?[17] Or will it also focus on Pacific ethical understandings of land and place? If it emphasises a rights' rather than a responsibilities and care perspective it will serve to further disintegrate Pacific value systems and the relationships with land and people which hold Pacific communities together.

For as Smith reminds us, ethics today (at least in dominant Western thinking "is dominated by two abstract theoretical paradigms: utilitarian and rights based… Both … entail the systemization and institutionalisation of procedures of deferral and distantiation…" (2001; p. 156). In other words both remove issues from place or context, and dismiss other forms of thinking. Utilitarianism emphasises the maximization of individual "pleasure" measured as utility. As such it could be considered anti-social or even anti-ethical, as Smith argues. In utilitarianism "all values are reduced to a single quantifiable currency, that of "pleasure" and ethics becomes a mere felicific calculus. Utilitarianism represents, in more than one way, the economisation of the ethical sphere."

(Smith, 2001; p. 157). At the same time, the rights-based perspective of ethics removes people from direct engagement and participation, and favours "supposedly" value-free, universal reason to the detriment of emotion, closeness and understanding of place and context"[18] (2001: 156). "Both ethical paradigms" Smith argues, "perpetuate modernity's dichotomising of reason/emotion, nature/culture, private/ public, land/property, humans/non-humans and its promotion of the ideology of rationalism. The latter serves to disembed human beings by viewing them as detached, autonomous units whose

17 See http://www.tipiglen.dircon.co.uk/landethic.html , p.4

18 Smith notably affirms that "the predominant forms of moral theory, whether deontological or utilitarian, attempt to provide a rubric that can be used to determine right and wrong by those not intimately associated with the circumstances – that is bureaucrats, governments, law courts and so on. Ethics thereby becomes an abstract theoretical tool for passing judgments or evaluating actions at a distance, rather than an embedded and intimate relation to relevant others". For Smith the emphasis on distance which is geared to "managerial and technical efficiency" reduces morality "to a series of abstract formula that can supposedly be applied to circumstances irrespective of the moral claims involved" (15-16). The problem with this approach, according to him, is that it takes away real moral responsibility and understanding of particular context which is so crucial to making ethical decisions. Philosophy "becomes an instrument of social management rather than … an expression of genuine moral concerns". This is in large part because ethical decision-making is removed from place. In contrast Smith states that an "ethics of place, (i.e. of environments) reconnects moral and physical spaces in such a way as to subvert our present ethical agendas" (152). It does this by focusing moral decision on context and particularly by highlighting the "specific ecology, the ethos of the locality [in question], its uniqueness, special qualities and associated traditions".

vival depends on the pursuit of their own self-interest".[19]

Another dimension raised by Leopold is the difficulty for society (in the dominant American context he was referring to) to view or imagine land. "We can only be ethical in relation to something we can see, feel, understand, love or otherwise have faith in". He therefore tried to provide a "mental image of land as a biotic mechanism" in the form of a "land pyramid".[20] In the Pacific, there is no need to cultivate an image of land or vanua, whenua, fanua, te aba, etc. as it is already there and has been for centuries. What must be developed is an open acknowledgement and theorising of the Pacific ethic of land or place while at the same time trying to better understand the difficulties it potentially faces in a modern context. Comparing it to other indigenous understandings of land and community, and learning from experiences and applications of a land or place-based ethic in other societies is essential. Developing synergies with the work (theoretical and applied) of environmental philosophers who promote thinking about place-based and land ethics is another useful direction, not only because of their enlightening critique of modernism and rationalism, but also because they suggest ways to further develop ethical ideas around land and place.

Val Plumwood for instance states that there are three kinds of place-based systems: place-centred, place-bound and place-sensitive. The first she attributes to indigenous societies, the second to feudal societies and the third she views as possibly "an achievable cultural project for the western present". In contrasting the place-centred system to modernity, she writes: "If in a place-centred culture social customs, etiquette, and institutions in every way nurture and recognise relationships to place, modernist culture and its institutions conversely and systematically neglect, frustrate and deny these relationships"(2002; p. 232).[21] This is the crux of the problem for many Pacific societies. The development and governance modes which they are confronted with and expected to adopt deny much of what is important in a place-centred society, where relationships are constructed primarily on the basis of the vanua, fenua, fonua and so on. As Val Plumwood states, a place-centred society "represents the other extreme to the contemporary extreme of an increasingly place-denying global society".

There is little inclination in dominant ethical thinking to take seriously the fact that there are different understandings of land and place in different cultures, even though this should be obvious, as Plumwood reminds us: "Different cultures have different bases for ownership of the land: these differences can be so radical that they amount to different paradigms of land relationship, incomprehensible to those from a different framework" (2002; p. 229).[22] Western "reification" of space has all but ruled out understanding and acceptance of place-centredness – the latter is considered anachronistic and often confused with place-boundedness. This is a mistake particularly in the Pacific. Communities are not place-bound: extensive networks allow people to move around but in doing so, they must be respectful of the place

19 According to Val Plumwood, rationalism (the ideology of rationality) has established a hierarchy which negates many beings: "In contemporary forms of rationalism, losers (some suggest this will be more than 80 per cent of us), such as the first world unemployed or third world subsistence farmers, are less rational, and in the rational hierarchy are placed in the position of "nature", rationally deficient as slaves were in classical times: if they lose under the current market rules, they have failed to make of themselves something rational or efficient, something the supremely rational machinery of the free market can use. They become waste, part of the sphere of externality, collateral economic damage. The fault is in them, not in the machinery or in its rationality, which is neutral, detached, and, beyond all question, supremely rational. Since it places the market in control over so many domains of human existence, economic rationalism, has great power to shape culture; its cultural media and ideals can promote identification with the rich and successful 10 per cent who are winning, and reflect their standards and styles of resources over consumption. It can portray people and low consumption lifestyles in negative or contemptuous terms." (2002: 21).

20 For details, see A Sand County Almanach, chapter 2.

21 Val Plumwood adds: "The survival requirements of economic availability as an employee in the labour market, for example, reauire each of us to spurn and set aside our place of extended family attachments. They demand of each of us, in the normal case, that we renounce our first love – the maternal place – ask us to leave and to forget, and this will be only first of many such betrayals required of us." (2002: 232-3).

22 Plumwood adds, "In some cultures it is the productivist and human-centred paradigm of expenditure or mixing in of human labour that validates the claim to own the land. This Lockean position, validating capitalist and colonial models of appropriation and ownership, is… another project of hyperbolised autonomy, a one-way, monological form of relationship in which nature's agency and independence is discounted and the land conceived as an adjunct to, or resource for, human projects. But land ownership can be based on far more communal and narrative criteria that yield relationships that are two-way and two-place, in which you belong to the land as much as the land belongs to you. In these it is not just a few exceptional pieces of land that are revered, but the land of belonging generally that is meaningful, filled with history, stories and the presence of ancestors." (2002; pp. 229-230).

they move into or out of. Place-boundedness in the Pacific occurred as a result of colonial rule, when people were prevented from leaving their villages (or as in New Caledonia and Australia, placed in "reserves" or "reservations"). Place-boundedness has reappeared as money and financial gain questions have become more important in Pacific societies. For instance, in the Solomon Islands now there is talk of restricting freedom of movement because of the disruptions to certain places due to large influx of people from other places who have bought land (sometimes surreptitiously). The "code" or ethical expectations of "place-centeredness" have in these cases been violated and a new balance must be sought, possibly somewhere between place-centeredness and place-sensitivity, particularly in the urban centres.

We would argue that problems associated with land in the Pacific have less to do with place-centredness than with lack of place-sensitivity by dominant governance and development paradigms. The latter generally "envisage" place in instrumental terms, reduce [if not deny] attachment to profitability and other market benefits and reduce the values of land to a potential for accruing these benefits". In other words they seek to undo place and replace them with "manipulable"[23] sites.

While there have been partial compromises made by colonial governments and now by international financial institutions and donors to accept that indigenous Pacific societies are reluctant to part with their land (thereby protecting themselves from displacement), there is little understanding or caring for the fact that this holding on to land is linked to a profoundly held and perfectly rational ethic of land or of place.

Pacific societies remain under pressure to privatise their land or at least find "efficient" ways to render it economically profitable. Although regional scholars and thinkers are suggesting and trying to promote new modes of governance and development which would favour place-based ethical systems (for instance, Ropate Qalo, Transform Aqorau and David Gegeo), other strong voices (from outside the region) (e.g. Helen Hughes) continue to advocate outright privatisation of land, thereby completely ignoring and dismissing indigenous ethical systems.

While Smith, Plumwood, Leopold and others have advocated for an ethic of land and place essentially as a way to reintroduce the natural environment as a major ethical concern in mainstream Western society, many of their concerns and ideas are relevant to Pacific land-based ethics. (Indeed Smith and Plumwood draw on indigenous understandings of land and place to make their case.) They advocate for a more thorough acceptance and understanding of land as a central dimension of ethics, arguing that ethics cannot be reduced to a vision of a man sitting at the top of an imaginary hierarchy where all other species and land are reduced to instruments for his personal pleasure and satisfaction. This is particularly so in a world where "we have taken a quantum leap further in insensitivity to place with the current form of globalisation, which increasingly demands such a heavy investment of time for the work of survival that attachments of any sort become problematic, and now demands that we prioritise a global standpoint of place which is the standpoint of no place or of abstract, virtual space" (Plumwood, 2002; pp. 234-5).

Conclusion

Generally speaking, Pacific communities are philosophically place-centred: they put a high value on their native and inhabited place[24] and on relational space. This is the case whether they are living in their place of origin or elsewhere, as their land – vanua, fenua, fonua etc, wherever it may be, remains embedded in memory and experience, imagination and dreaming. This attachment to place defines group boundaries as well as ushering in a sense of self that is closely intertwined to that of the group.

23 See Casey, 1993:10.

24 Inhabited as opposed to merely residential place which Orr (1992; p. 130) quoted in Gruenewald (2003; p. 9) distinguishes: "A resident is a temporary occupant, putting down few roots and investing little, knowing little, and perhaps caring little for the immediate locale beyond its ability to gratify…. The inhabitant, in contrast, 'dwells'… in an intimate, organic, and mutually nurturing relationship with a place."

Indeed, 'to be without a place … is to be almost nonexistent' (Gieryn, 2000; p. 488).[25] Place and land are thus identity, home, kin, food and wealth. It is therefore not surprising that Pacific societies have constructed an ethic of place in which obligations to the land and those of the land are foremost. Different communities may emphasise different ways of fulfilling these obligations but the aims are similar. This ethic of land (and place) has been a consistent feature of Pacific societies as we know them and will likely continue to be so as long as the pressures of globalisation can be mediated.

This ethical outlook is one which sustains and enriches Pacific communities wherever they find themselves. As Teaero demonstrates, the idea of the "shifting navel" with all its implications, guides I-Kiribati people wherever they are as it enables them to consistently think about their present place in relation to their home place. It gives them a fixed point in a moving world and allows them to keep hold of their identity markers while reading their changing surroundings (Teaero, 2005b).

The Pacific ethic of place contributes significantly to social and environmental well being throughout the region, even if it cannot resolve all dilemmas. It is therefore important that it be allowed to prosper and evolve, and that it particularly be acknowledged in governance and development policy in the region. An obvious way of pursuing this objective is to give greater consideration to community capacity and forms of organisation and development, allowing them to set the agenda according to their norms and aspirations.

An ethic of place naturally lends itself to a greater focus on local development and investment. This does not have to be to the detriment of the national level if it is accepted that local development usefully contributes to national overall development. The long term wealth of countries depends on the useful and sustainable employment (or activity) of people wherever they are with less emphasis on extractive industries and dominantly urban-driven or focused activities.

Another way to enhance the profile of place and its ethical ramifications is to encourage what Gruenewald calls a "critical pedagogy of place", which fosters "the production of educational discourses and practices that explicitly examine the place-specific nexus between environment, culture and education" (2003; p. 10), and draws teaching and learning away from an emphasis on decontextualisation and standardisation.[26] This approach must also be incorporated into the analytic focuses of the various disciplines. This would encourage a new way of imagining of knowing and doing that would transcend the incompetency evident in disciplinary analyses, particularly those that limit themselves to the use of statistics to describe the "social" (Gieryn, 2000).

Finally embracing place or "Getting back into place" is important for the long term well being of the Pacific, as well as for our larger "place-world" (Casey, 1993) as argued by contemporary environmental philosophers. The Pacific has a definite "comparative advantage" in this area: rather than shunning it or seeking ways to undermine it, teachers, academics and policy makers should acknowledge it and look for opportunities to build on it. This may also lead to greater "place sensitivity" by non-place centred societies. In the long term, this can only be beneficial not only to the Pacific region, but to the global environment.

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25 The sense of utter displacement that often afflicts the denizens of carceral institutions or disempowering 'sites' (prisons and mental asylums) best exemplifies this social dyspepsia.

26 As Gruenewald notes, "This idea is radical because current educational discourses seek to standardize the experience of students from diverse geographical and cultural places so that they may compete in the global economy" (2003; p. 7).

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From biosphere to technosphere to biotechnosphere: the Indian scenario in an eco-ethical perspective*

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Introduction

The term "biosphere" was coined by Austrian geochemist Eduard Suess in 1875, who framed it concurrently with two other similar terms, viz., hydrosphere and lithosphere. The other sphere – atmosphere – was already in use in scientific literature. Although Suess invented this term, the concept of biosphere was propagated and made popular by the Russian geochemist, V.I. Vernadsky, through several of his writings during the 1920s and later. In his writings on the biosphere, Vernadsky laid stress on its two essential features: firstly that the biosphere is the envelope of life, i.e., the area of existence of living matter, and secondly that it can be regarded as the area of the earth's crust occupied by transformers which convert cosmic radiation into effective terrestrial energy (Lapo, 1982). Thus biosphere is that part of the atmosphere, hydrosphere and lithosphere where life exists, and is the largest macroscale system on earth, harbouring a mind-boggling diversity of organisms, of which some two million are presently known to science.

While the concept of biosphere emphasizes the key role of all living organisms: plants, animals and microorganisms, large, small or microscopic, not only in the evolution of the biosphere itself, but in modifying and shaping the other three spheres, viz., the atmosphere, the hydrosphere and the lithosphere, certain thinkers tended to look at the process of evolution in a very different light.

As man (Homo sapiens sapiens) represents the only species that by virtue of the tremendous development of its brain and central nervous system can fully comprehend, and albeit control, with the aid of technology, the myriad biospheric structures and functions, they reasoned that the biosphere has transcended into a 'noosphere' governed by the mind of man (Vernadsky, 1944).

However, Vernadsky's noosphere lacked the technological arrogance so characteristic of the noosphere of Teilhard de Chardin, who believed that the ultimate goal of progress is for man to technologically dominate the earth and reverse the normal evolutionary flow towards diversity and divergence to one that is convergent towards the human species.

Thus de Chardin's noosphere was essentially the vision of a technosphere, where a technologically managed nature - the "second nature"- is totally under human control (Sessions, 1995). Human subjugation of other biological species and systems and 'man-nature dualism' were also propagated by many western scientists and thinkers, especially Decartes, Bacon and Liebnitz. Thus the biosphere of Suess was viewed more as an anthroposphere, and later, with the advent of more and more powerful technology, as a technosphere in the western countries. These worldviews dominated the societal attitude towards nature, and till today run strong among many decision-makers, scientists and administrators the world over. With colonial expansion and spread of global trade, technology became increasingly subservient to big business and this gave rise to more ecological and ethical contradictions that lie at the root of the present environmental crisis. However, since the publication of Rachel Carson's Silent Spring in 1962, the "other voices" of Spinoza, Thoreau, Leopold and others began to be heard again, and alternative roles of man as "steward", "partner" or "participant" in the biosphere were put forward by many deep ecologists or even "soft" anthropocentrists (Zweers, 1994).

Nevertheless, the "dream" of solving all human problems through technology has not been abandoned by its ardent proponents and now we are entering an era where biotechnology is being projected as the panacea to all problems including that of the environment such as pollution and biodiversity decline.

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In the intense and often bitter debate that has been raging over the implications of biotechnological research and application, three distinct schools of thought could perhaps be recognized: the first school prescribes that biotechnological research and application should continue without any hindrance as it has no adverse impact on the ecological, social, cultural and religious systems; the second that believes that such research and application are not to be pursued at all because of their adverse implications on all or some of the above systems; and the third that lies between these two extremes advocates exercise of caution and adoption of ecological, socio-cultural and ethical safeguards before and while going 'full steam' with all technological and biotechnological research and application.

Meanwhile, technology remains the major, if not sole, yardstick in classifying nations as "developed", "developing" and "underdeveloped" and in identifying communities and regions within a given country as "primitive" or "backward", ignoring all other social, cultural and ethical attributes. A biotechnological yardstick is likely to be applied in near future. One wonders how ethical such yardsticks are.

While the above developments have been taking place in Western countries, how have developing nations responded to these concepts and applications? This paper attempts to trace the patterns of transition of India from a largely naturalistic to a technological society and illustrate the ethical contradictions during this process at a point of time when the country stands poised to enter the biotechnology era.

'Biosphere society and state' in ancient India

After the decline of the Indus Valley Civilization (2500-1750 B.C.) that had flourished in parts of north western India and Pakistan (Allchin, 1998), the Indo-Aryans who are often designated as the "Vedic people" settled in the north western region of the Indian subcontinent during the early Vedic age (c 1500-1000 B.C.). During the later part of this period they started moving in a south easterly direction into the Upper Ganga Valley, which at that time was a densely forested area inhabited by several forest-dwelling tribes. During this period of expansion, the Vedic people did not appear to have had any significant conservation mechanisms or ethics in their culture. Their strategy was to clear the forests by felling and setting fire and killing or driving away the forest-dwellers. However, in course of time, they chose to adopt more prudent and even ecocentric policies because of several reasons. Firstly, there are indications that several land use failures, albeit localized, took place due to a sharp decline in land:man ratio in Northern India during c 1350-800 B.C. Secondly, more and more people, including many ascetics and roving mendicants, disowned their allegiance to the old religion, especially its wasteful practices and exploitative principles, and preached an ethics that spoke of increasing harmony with nature.

The Upanishads (ancient texts written in 800-700 B.C.) embodied these non-conformist ideals that denounced animal sacrifice and moved on to a higher ethical plane (Bhattacharya, 1986). Subsequently, the rise of Buddhism and Jainism was the culmination of this process. Both these heterodox faiths denounced animal sacrifice, and advocated non-violence.

Thirdly, the naturalistic worldview of the forest-dwelling tribes - who were mostly hunter-gatherers and/or shifting cultivators - influenced the societal attitude towards nature. These groups practiced a much more prudent utilization of the resources, and had several in-built conservation mechanisms in their culture that included the maintenance of sacred groves and taboos/restrictions in hunting and resource extraction (Gadgil and Guha, 1992).

The changed societal attitude influenced state policies as well. The first evidence of the State adopting conservation measures in the form of protected forests is found in Kautilya's Arthasastra, an elaborate text, the earliest stratum of which is believed to have been compiled between 400 to 300 B.C. This treatise indicates that several measures to adopt environmentally benign ethical positions were adopted by the Mauryas. These ethical attitudes often transcended from anthropocentric to ecocentric, and envisaged total protection to not only things animate but those inanimate as well.

The State also created a list of auspicious animals that were accorded legal protection. Subsequently, conservation ethics in India gained a new momentum during the reign of Emperor Ashoka, who embraced Buddhism. He drastically reduced the daily slaughter in the royal kitchen from several

thousands animals to only two or three, urged the people to abstain from, or at least exercise restraint in the killing of animals and capture of fish, and brought a number of animals that included the rhinoceros, several birds, and even invertebrates under State protection (Smith, 1909; Gupta and Ghosh, 2003a, 2003b).

Thus a compassionate attitude towards other creatures and to nature as a whole formed a part of Indian culture. The knowledge system forming the basis of these ethical frameworks evolved through long periods of experience, often harrowing, of the Vedic people as they colonized and converted a forested country, and through interactions and exchanges with the forest-dwellers who already possessed the knowledge for living in a prudent and sustainable manner in forested tracts.

Till today, the descendents of these hunter-gatherers and shifting cultivators are maintaining protected areas in the form of community reserves or supply forests as well as sacred groves in different regions of India. Although they practiced hunting, they had several taboos and ethical restraints and did not deplete the stock of the animals on whose flesh they depended for their nutrition (Gadgil and Vartak, 1981; Gadgil and Guha, 1992; Gupta and Guha, 2002; Singh *et al*., 2003).

Thus Indian society, both tribal and the "mainstream", developed and nurtured a "biosphere ethics" that had strong underpinnings of ecocentrism very early in its history, and this tradition by and large continued to hold sway for a period of time spanning over about 2500 years. In spite of the long history of cultivation in the Ganga Valley, for instance, substantial areas remained under forests even during the Mughal rule (Erdosy, 1998).

The Indian 'technosphere': Short-term, exploitative strategies

India entered the technological age with the advent of British rule, first administered by the East India Company (EIC) and subsequently by the British Government. For obvious reasons, the British policy towards extraction and management of natural resources was exploitative and revenue-oriented, notwithstanding the fact that many colonial scientists and administrators could foresee the dangerous consequences of such an approach and had tried to influence the government to take more ecological and conservation measures, albeit with little success (Grove, 1995).

Deforestation for agricultural expansion and forcing the peasants to substitute food crops by cash crops led to ecological degradation and desertification in large tracts of North India within a period of thirty years. Extensive gully erosion resulting in drastic changes in the landscape, drying up of rivers and other water bodies, a more extreme climate, and the salinisation of soil was accompanied by pauperization of the farmers (Mann, 1998). Many of the latter turned into outlaws and the entire social scenario was irreversibly changed, especially in the area between the Yamuna and the Chambal rivers.

The forest policy and practices also suffered from serious contradictions. The forest policy of India was revised in 1952 and then in 1988 since its first formulation in 1894. If we view the outlook of the founder of forestry in India, Dietrich Brandis, we find that he could well recognize both economic and ecological utilities of forests. The first ever *Manual of Forestry* by William Schlich also recognized these values of forests: along with generation of profit, they regulated soil and air temperature regimes, climate, water supply and rainfall, and prevented land slips, avalanches, siltation of rivers and wind erosion. Paradoxically, Brandis also was a firm believer in the German forestry principle of "minimum diversity" that encouraged the conservation, scientific extraction and planting of commercially valuable species like teak and *sal* (*Shorea robusta*), while ignoring the other trees, creepers and epiphytes that contributed to the rich diversity of tropical forests as "arbitrary details of nature" and replacing them with economically important species, wherever possible (Rajan, 1998).

Thus the European foresters were guided by the Cartesian-Baconian worldview of improving over nature and utilizing it for human benefits. This resulted in an inherent contradiction between what was preached and what was practiced. Ecological values of forests were recognized in theory, but no emphasis was given to maintenance of diversity, which is critical in maintaining ecological integrity. This contradiction continued to plague Indian forestry practices even during the post-independence period, and it is not yet certain whether it has been totally purged out of the system even today.

Monoculture is still advocated by many foresters and even university academics and scientists. Eco-ethical contradictions in land use policy are also amply illustrated in the British strategy towards the establishment of tea gardens in Assam. Robert Bruce, a Scotsman, first discovered the native Assam tea plant in 1823 from a Singpho (a tribe inhabiting the border areas of Assam and Arunachal Pradesh in North East India) chief. Barely within two decades of this finding, scores of tea gardens sprang up in Upper Assam, followed by those in Cachar and Sylhet (now partly in Bangladesh) districts in the southern parts of the state during the 1850-60s.

By 1900, it grew into a fourteen million pound sterling industry and remains the mainstay of the economy of Assam, besides oil, even today. However, everybody conveniently forgot the Singphos who did not benefit in any way from the tea industry. In contrast, rich tributes have always been paid to the pioneer planters who "braved dense jungles, deadly diseases and ravaging wild animals". Ethical contradictions continued when the British brought workers belonging to various tribes from Bihar, Bengal, Orissa, Madhya Pradesh, Uttar Pradesh and even Tamil Nadu.

Taking advantage of the land-alienation and poverty in their native places, these people were ruthlessly uprooted from their land and the forests, rivers and mountains where their gods resided, and lured to work in tea gardens hundreds of miles away from their native place (Gupta, 2002). All these developments were accompanied by ecological degradation when large tracts in foothills were deforested to set up the tea gardens.

Furthermore, in order to meet the demands of the burgeoning tea industry, even hill forests and alluvial forests in the valleys were decimated (Gupta, 2001).Tea cultivation has also been marked by extensive application of inorganic fertilizers, insecticides, herbicides and other agrochemicals. These chemicals are not only contaminating the soil and water of the tea gardens and their surrounding natural ecosystems, pesticide residues are persisting in the tea leaves and in processed tea as well (Jha *et al*., 1999; Jha, 2000).

Pesticide sprayers are hardly made to wear protective devices, thus exposing them to deadly toxins. At the same time, the tea industry is promoting tea as a health drink having many medicinal properties, totally ignoring the toxic residues that most samples are likely to contain. The Tea Board while paying "lip-service" to organic tea cultivation is not encouraging research in organic tea farming.

However, available evidence clearly shows that organic tea gardens could sustain yield while maintaining much better soil and water quality as well as a richer biodiversity when compared to those in conventional tea gardens using pesticides and other agrochemicals. They also generated more employment for workers engaged in manual removal of weeds and compost preparation and application, thereby providing a sustainable solution to the vexed labour issues in the tea industry (Gupta, unpublished).

The contradictions of the Indian technosphere can also be illustrated by the green revolution in India. Admittedly, the green revolution (GR) enabled India to make rapid augmentation of its food production from about 51 million tons (mt) in the 1950s to about 206 mt at the turn of the century (Ministry of Agriculture, 2000). However, in spite of a continued increase in production, yield per hectare has started to decline. At the same time, four decades of heavy fertilizer inputs and pesticide use has led to loss of soil fertility, toxic contamination of soil, water, foodstuff and biota. Excessive irrigation has resulted in salinisation and water logging of soils, while groundwater reserve is being fast depleted due to unsustainable extraction. Another serious contradiction lies in the fact that although per capita food availability has increased from 452 g/day to 476 g/day, India has the highest number of poor people among all the countries of the world (*c* 250 million) and accounts for over one-fifths of the world's poor. More than 50 % of pre-school children and women suffer from malnutrition (IARI, 2004). Many experts feel that the problems chiefly emanate from the fact that the GR emphasized increased inputs and production while ignoring sustainability criteria.

It was a reductionist strategy that did not care to incorporate holistic, ecological corrections with time. However, it is not that there was no cognizance of the risks of exploitative agriculture when the GR began. As early as in 1968, M.S. Swaminathan, one of the chief architects of GR, had warned about the dangers of such agriculture if undertaken with an immediate profit motive without paying due attention to conservation of soil fertility and soil structure.

He had further cautioned that irrigation without drainage would result in alkaline and saline soils; pesticide residues would pose a serious health risk, and indiscriminate tapping of water would exhaust this valuable resource (Dasgupta, 2000). Because of the input-intensive nature of GR technology, poorer farmers with small farm holdings were increasingly marginalized.

Another drawback of the GR was its confinement to a relatively small area representing less than 15 % of the total area under food grains that in turn contributed 56 % of the total food grain production of the country. This has naturally led to regional imbalances and disparities. The traditional food bowls of India did not benefit much from GR, while the semi-arid savannah landscape of Punjab and Haryana were intensively cultivated without adopting appropriate ecological safeguards.

With the ecological and ethical contradictions of GR increasingly surfacing within four decades of its initiation and threatening to negate its benefits, many experts are now looking up to biotechnology to rescue Indian agriculture from the stalemate in which it has landed itself. However, remembering the words of Swaminathan, whether in fertilizer-pesticide aided GR, or in the post-GR phase driven by biotechnology, if we are governed by an immediate profit motive without taking into consideration the ecological and ethical safeguards and support systems that would lend the much-needed sustainability, the euphoria is almost certain to be short-lived. In this context, I shall now try to make an ecological-ethical analysis of the current applications of agricultural biotechnology in India, especially illustrated by the trials of *Bacillus thuringiensis* (Bt) cotton in parts of western and southern parts of the country.

Agricultural biotechnology in India: Hasty implementation

Cotton, cultivated in parts of south, west and north India is plagued by pest infestations warranting heavy application of pesticides. It is estimated that about 54 % of all pesticide use in India is in cotton and 70 % of production costs in cotton is in pesticides. Because of this problem, the yield is half the world average, although at 9 m ha, India has the world's largest area under cotton. The major pests of cotton are *Helicoverpa armigera* (American bollworm), *Spodoptera litura* (armyworm) and *Bemisia tabaci* (whitefly) (Bharathan, 2000; Raghuram, 2002). In early 1980s, introduction of synthetic pyrethroids were thought to be the answer to these pests, although after initial success, the insects developed resistance, thereby rendering them ineffective. The debt trap into which the farmers landed themselves, led to suicides, the unofficial tally of which is around 10,000 (Raghuram, 2002). Introduction of Bt-cotton is thought to be a long-term solution to this problem. Pests feeding on cotton implanted with *Cry1Ac* gene from the bacterium *Bacillus thuringiensis* are killed by its toxic action.

It is therefore argued that cultivation of Bt-cotton would not only push up production by reducing damage from pests, but also lead to a decline in pesticide use. However, the solution is not so simple, as there are several aspects that need critical examination before the introduction of Bt-cotton or other Bt-crops in any area. Firstly, there is the problem of development of Bt-resistance in pest species. To tackle this problem, the creation of "refugia" with blocks of non-Bt-cotton between Bt-cotton plots has been recommended.

Assuming Bt-resistance genes to be recessive, the pests having these genes will mate with the "wild" individuals in the refugia, and the resultant offspring being Bt-sensitive will die when they ingest Bt-cotton. Furthermore, the refugia shall be sprayed with pesticides to kill both normal Bt-susceptible pests and resistant mutants. However, if the mutant gene is dominant, for which there is already some evidence in a pest of corn (Haung *et al*., 1999), then the strategy of refugia will backfire, as these will provide rich breeding grounds for the resistant pests that would spread like wildfire, leading to disastrous consequences. This would entail constant monitoring for development of Bt-resistance in the field. Secondly, it will be very difficult for small or even medium farmers to allocate space for refugia. Besides, they would now have to buy costly seeds and pay for the pesticides as well. Thus agricultural biotechnology is likely to be as big farmer friendly as the GR had been.

The government of India has been totally insensitive to these problems when it approved the commercial release of Bt-cotton on 26 March, 2002. It has ruled that at least 20 % of the fields must be planted with non-Bt-cotton in the form of a peripheral belt 2.5-3.5 m wide. It is difficult to imagine how small farmers would cope with this regulation. Interestingly, monitoring of these refugia has to be carried out by the

seed company itself, thereby raising doubts about its propriety and efficacy (Raghuram, 2002).

Thirdly, some recent findings raise critical questions about the suitability of Bt-gene in the Indian context. Fakrudin *et al*. (2003) found high levels of Bt-resistance in some geographical populations of *H. armigera* in south India, while another study (Kranthi *et al*., 2005) revealed that *Cry1Ac* expression is very low in the ovary and boll rind of the plant which are the most favoured sites of bollworm attack.

The level, although high in the leaves, sharply declines as the plants gain in age. Thus introduction of Bt-cotton, the first major step taken by India in adopting agricultural biotechnology may be branded as a hasty 'crisis management' exercise to appease the desperate cotton farmers. The benefits and risks of Bt-cotton adoption were not discussed with the farmers, and if any consent was taken, it definitely flouted the prior informed consent principle. This has happened in spite of India having a string of regulatory bodies such as the Review Committee on Genetic Manipulation (RCGM) and Genetic Engineering Approval Committee (GEAC) for introduction of transgenics in agriculture. The National Biotechnology Development Strategy also states that it is essential "to work actively and transparently to inform and engage the civil society in decision-making……The government and the industry must actively promote access to information on the benefits and risks in a balanced manner". In practice it appears that the government was pressurized by Monsanto (USA) and Mahyco (India) who were keen to introduce Bt-cotton.

Thus, neither when it was bolstering its technological capability, nor today when it intends to apply biotechnological solutions to its problems, India has tried sincerely to address the accompanying social, ecological and ethical issues. The impact of technology (and now biotechnology) on forest-dwellers, small farmers and other marginal communities has not been assessed properly, nor on biodiversity that has time-honoured, intricate and inseparable links with livelihood and cultural practices of a large section of Indian people. These contradictions are perhaps reflected in India being ranked 127th among 177 nations based on its Human Development Index (HDI) in spite of its phenomenal economic growth and the tremendous strides made in science and technology (The Telegraph, 2005). This paper argues that just as its transformation into the technosphere has been marred by contradictions, so would be that into the biotechnosphere unless these vital issues are resolved along sound ecological and ethical principles.

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Ethical aspects of using international rivers: Some policy proposals for optimal sharing of Teesta River water*

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Introduction

Water is the symbol of life. Life without water cannot survive. Access to freshwater is a basic human right. Water is the most wonderful fluid which the world relies on for its existence. Sharing water in international rivers is a common problem among riparian states. Political treaties signed to solve water sharing problems regarding international rivers seldom last long. Recommendations from research in order to bring about optimum economic benefits for all the riparian states are also rarely implemented. One major cause of this is the negligence on the part of policy planners to follow or abide by ethical principles.

Bangladesh is surrounded by India on three of its four sides. There are hundreds of rivers in the country, 54 of which have their origin in India. Naturally, being situated at the downstream, Bangladesh is dependent on India regarding getting an equitable share of international river water. Water problems in Bangladesh arise both during the dry season and in the rainy season. Flash floods occur in summer and in the rainy season by the sudden release of water at the upstream or by heavy downpour. Again, in the dry season, small rivers dry up because of a shortage of water in the big rivers owing to withdrawal of water at upstream through barrages built and operated by India.

As a result, irrigation projects in Bangladesh, based on river water, cease to function, causing losses in crop production and an increase in poverty. An example of such a controversial use of common river water by India and Bangladesh is the Teesta Barrage Irrigation Project undertaken in Bangladesh and the Teesta Barrage (Gazoldoba Barrage) built 60km upstream on the same river by India. In this paper, we have proposed some optimal ways of sharing Teesta water along with some alternative means to solve the problem. We believe that equitable sharing of fresh water is not possible through political and economic means only, Instead, adherence to ethical principles by all parties would pave the way for a long-term solution.

Ethical principles for freshwater use

At present, the crisis of freshwater is a common issue for most people worldwide. The sources of freshwater are becoming scarce and polluted due to an expansion of industry and souring human needs. The sharing of international freshwater sources has become one of the major issues of conflict between neighbouring states. The International Hydrological Programme (IHP) of UNESCO has set up an intercultural and interdisciplinary working group to report on the ethics of using freshwater. This group has looked at a wide range of topics, all of which relate to the ethical management of water: scarcity of food, health and sanitation, natural disasters, decision-making and management, ecology, the special role of women, history, the challenges of technology, conflict, intense use of ground water and the consequences of dam building. (Selborne, 2005). A sub-commission was made in this regard and its first meeting was arranged in Aswan in October 1999. The sub-commission argued that, rather than analyzing once more the ethical issues of water management, it should try to promote best ethical practices. They identified some fundamental principles (Selborne, 2005). Those are as follows:

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- **Human dignity**: for there is no life without water and those to whom it is denied are denied life;
- **Participation**: for all individuals, specially the poor, must be involved in water planning and management with gender and poverty issues recognized in fostering this process;
- **Solidarity:** for water continually confronts humans with their upstream and downstream interdependence and initiatives for integrated water management may be seen as a direct response to this realization;
- **Human equality:** for all persons ought to be provided with what is needed on an equitable basis;
- **Common Good:** for by almost everyone's definitions water is a common good, and without proper water management human potential and dignity diminishes;
- **Stewardship:** which respects the wise use of water;
- **Transparency and universal access to information:** for if data is not accessible in a form that can be understood, an opportunity will arise for an interested party to disadvantage others;
- **Inclusiveness:** water management policies must address the interests of all who live in a water catchment area. Minority interests must be protected as well as those of the poor and other disadvantaged sectors. In the past few years the concept of Integrated Water Management (IWRM) has come to the fore and the means to ensure equitable, economically sound and environmentally sustainable management of water resources;
- **Empowerment:** for the requirement to facilitate participation in planning and management means much more than to allow an opportunity for consultation. Best ethical practice will enable stakeholders to influence management." (Selborne, 2005).

Laws of international river water sharing: Some examples

Rivers have been used for economic purposes since ancient times. However, in early times river use was limited to navigation and to some extent, for irrigation purposes (Smith, 1931; Schachter, 1977). In recent years, the use of water for agricultural and industrial purposes has increased tremendously. The demand has expanded vastly, even though the supply of fresh water has become scarce, owing to natural and anthropogenic causes (Schachter, 1977).

Naturally, each river system forms an indivisible and unique physical unit, although it may be divided artificially by political frontiers (Smith, 1931). From this basic fact emanates the concept of a "drainage basin" which implies integral development, giving a high priority to maximization of benefits for the basin as a whole, by reducing wasteful use and developing a comprehensive and unified scheme to be followed by all those who are concerned (Schachter, 1977).

At Helsinki in 1966, the International Law Association approved a draft set of very reasonable rules regarding equitable use of international river waters (Starke, 1987; Schachter, 1977). Of the various factors listed, the following points are worth mentioning:

(1) Water utilization of the river basin at present and in the past has to be considered;

(2) The extent to which the population of each basin state is dependent on the river water has to be taken into account;

(3) Research on the comparative costs of alternative means to meet the economic and social needs of the people of the basin states should be carried out;

(4) Care must be taken to avoid unnecessary wastage when utilizing river water;

(5) Availability of other resources has to be considered;

(6) The extent to which compensating one or more of the co-basin states for adjusting conflicting uses has to be evaluated;

(7) The extent to which the necessities of a riparian state can be met without causing substantial harm to a co-basin state has to be taken into consideration (Schachter, 1977).

During the late 19th century, the Harmone Doctrine, according to which a state has the absolute right to use the water of the rivers flowing through its territory as it wishes, without considering its effects on other states was quite influential. However, this doctrine has never been followed. Rather, there are various examples of peaceful water sharing between two or more riparian states through which a river flows. Below, we point out some treaties of this kind.

In 1909 the Boundary Water Treaty between the US and Canada was established. Article Two of the treaty reserved for each side unrestricted territorial control over the boundary water within their territory and available legal remedies. However, under the 1961 Columbia Water Treaty, both the US and Canada adhered to the principle of shared enjoyment and optimum utilization of common waters through international cooperation. They have jointly undertaken comprehensive and integrated regional planning for the development of the Columbia water resources (The UN L. Series, 1963).

In 1948, Austria, originally a supporter of the Harmon Doctrine, settled its water dispute with her neighbours (Bavaria, Czechoslovakia) on the basis of mutual recognition of rights (Abbas, 1984).

Even in extreme cases of common water disputes, accountability of claimants and recognition of mutual rights are apparent. An example is the sharing of the Jordan River water between the Arabs and Israel. Both parties had either implemented or taken initiatives to utilize the Jordan waters unilaterally. Although the initial efforts for negotiation by an envoy of President Eisenhower (Special Ambassador Eric Jonston) had failed due to political reasons, eventually both parties came to recognise that each had rights to a reasonable share of the Jordan River water and that neither party should unilaterally interfere with its counterpart's share (Lecaros, 1963, cited in Islam 1987).

Through the treaty between Egypt and the Sudan (1926), Egypt got a reasonable share of the Nile water by cooperating in building a reservoir at the upstream, within the territory of Sudan. This case is an example, proving that "mutual confidence and cooperation in all matters concerning the river and its waters" are of much greater importance than that of arbitral tribunals, legal rules and expert commissions joined together (Smith, 1931).

In the controversy between Chile and Bolivia on the issue of sharing the Rio Lauca water, Chile despite being the upstream country did not try to justify its action by adhering to the Harmone Doctrine. Rather, it recognized the fact that Bolivia also had specific rights to use the Rio Lauca water (Lecaros, 1963, cited in Islam 1987).

On the question of the use of international drainage basin water, there exists a persistent pattern of state practice and community expectations of shared competence and control. This pattern is reflected in the recurrence of identical provisions in a significant number of treaty practices of basin states all over the world. These treaties specify, in one way or other, the freedom of action of the signatory basin states.

The multiplicity of these treaties is the clear evidence that basin states have felt an obligation to work on the basis of mutuality and cooperation in the use of their common waters. The number of basin states which are parties to these treaties, their spread both over time and geography, and the fact that, "...in these treaties similar problems are resolved in similar ways, make of these treaties and negotiations persuasive evidence of law creating international practice" (Islam, 1987). The irrefutable exercise of national sovereignty over the Teesta by the basin states would appear to be contradictory and a deviation from the existing international practice. Moreover, the practice of the Indian sub-continent vitiates any contention of an invincible exercise of sovereign dominion over the Teesta River.

Research on the Teesta water sharing issue

Even with limited and unused natural resources, natural and human-made disasters and other problems, Bangladesh is continuing her economic development by increasing agricultural production. To achieve this goal, the government of Bangladesh undertook some irrigation projects such as the Ganges-Kobadak Irrigation Project, the Chandpur Irrigation Project, the Muhuri Irrigation Project, the Meghna Dhonagoda Irrigation Project, the Coastal Embankment Project (Khan, 1994) and the Teesta Barrage Project.

The government completed the Teesta Barrage Project for irrigation purposes to boost agricultural production by bringing more land under cultivation during the dry season. However, the Gazoldoba Barrage (Teesta Barrage), built by India 60km upstream of the Teesta River (in Indian Territory) made the Dalia Barrage project useless.

In this regard, a brief history on the use of the Teesta water for economic purposes (e.g. irrigation, navigation, producing electricity etc.) needs to be discussed. Below we see a map of India and Bangladesh and a picture of the Dalia Barrage on the Teesta River.



Figure 1: A view of the Dalia Barrage, Bangladesh.

Thoughts regarding the utilization of the Teesta water for irrigation purposes began during British rule before the partition of India. Later, India and Bangladesh implemented their plans separately to use Teesta water for irrigation and for that purpose built two barrages on the river in their own territories (GPRB, 1993). However, the project implemented by Bangladesh, with a view to increasing agricultural production to a great extent, has now come to a point of closure, because of its downstream location and scarcity of water in the dry season. Many bilateral meetings took place between the authorities of the two countries but only in vain.

Bangladesh is a riverine country with an agriculture-based economy. Since the 1950s, attempts have been made to modernize agriculture and to reduce dependence on nature. In the northern region of the country, in order to save a vast area of plain and fertile agricultural land from flood and drought, the Dalia Irrigation Project on the Teesta River was implemented and started operating in 1993, (providing irrigation water for only about 30% of the project area) (GPRB, 1993).

During the first five years of operation, an increase in agriculture production was clearly observed. However, later, as a result of some problems, the operation of the project came to a standstill in the dry season. Hence, the largest irrigation project in the country, in which millions of dollars was invested, became a cause of considerable economic loss and environmental concern for the inhabitants of the Teesta basin area, let alone alleviation of poverty by agricultural development.

For the socio-economic emancipation and environmental control in the Teesta River basin area, two surveys were carried out in 1999 and in 2002 both in Bangladesh and in the Indian territory respectively. The objective was to recommend an optimal social policy model to ensure the sharing of dry season water, with the highest possible benefit for both the countries. With an objective to maximize GRP of both Dalia (Bangladesh) and the Gazoldoba (India) regions, the results of computer simulations (using IO Input-Output data of both countries) on the increase in Gross Regional Production (GRP), increase in agricultural production, increase in employment of labour in agricultural fields and possible trade and businesses between the regions are shown in the following figures.

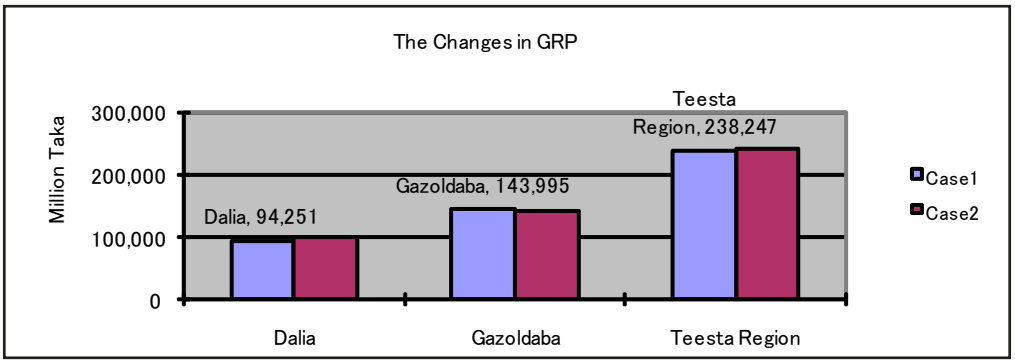


Figure 2 Optimal Share of Water in Dry Season

Figure 2 shows the present share of the Teesta River between the two barrages Dalia (15% = 4,900 cusecs of water) and the Gazoldoba (85% = 27,767 cusecs of water) in the dry season. Case two shows an optimal share of water and its amount. In Case 2 the share of Dalia has increased by 6% (total 21% = 6, 794 cusecs) of water to make it an optimal share. The share of Gazoldoba, India is 79% = 25,873 cusecs of water in the dry season.

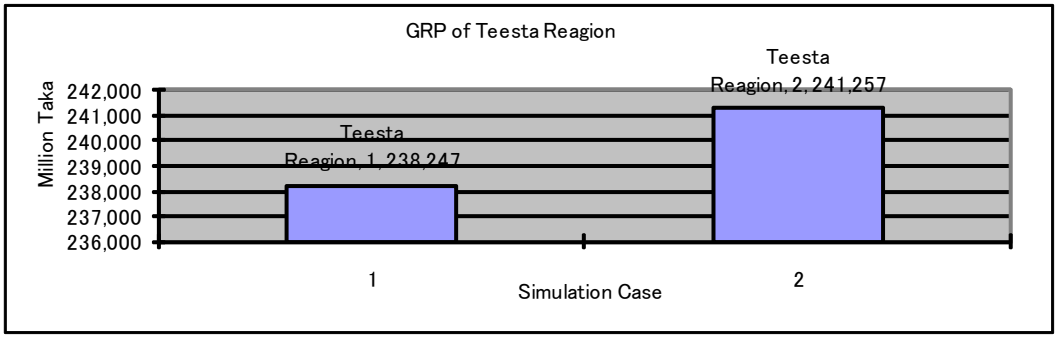


Figure 3 Gross Regional Production (GRP) of the Teesta Region

Figure 3 shows that at present, the Gross Regional Production (GRP) of the whole Teesta region can be increased by 238,000 million Taka for Case 1. Case 2 shows an increase in regional GRP by 241,257 million Taka.

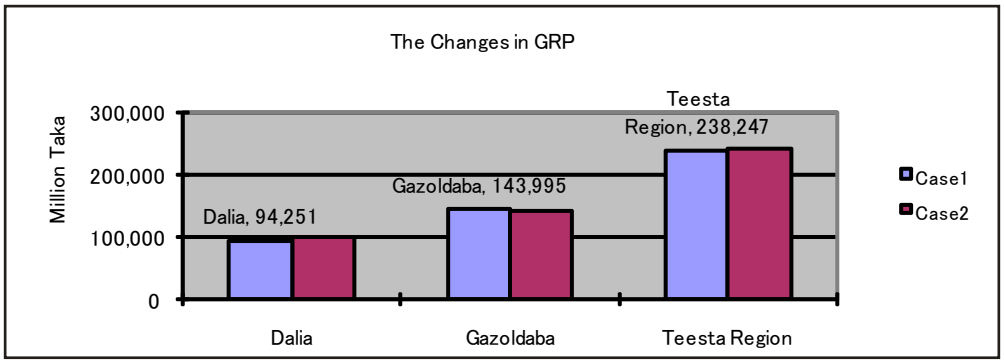


Figure 4 Changes in Gross Regional Production (GRP) in all the areas

Figure 4 shows almost no significant changes in GRP of the Dalia, Gazoldoba and the Teesta regions in Case one and Case two separately.

In a nutshell, the simulation results point out that food grain production in Dalia increases, but in Gazoldoba food grain production decreases and other crop production in Dalia is almost equal to food grain but in Gazoldoba other crop production increases. The Gazoldoba area is efficient for other crop production, but some crops do not need a lot of water, such as food grain production. The Dalia area is suitable for food grain production.

The Input-Output (I-O) data of both India and Bangladesh have been squeezed into 23 sectors from 79 total sectors of Bangladesh I-O Table (1993-94) and 115 sectors from Indian I-O Table (1993-94). I have used the I-O King Software to prepare a regional I-O table for both Bangladesh and India. We estimated the GRP of both regions from the national I-O tables of the respective regions. The GRP of Dalia region in its I-O table was 84176.5 million Taka and Gazoldoba region was 115,617.7 million Taka.

The reality, suitability and fitness of construction of this simulation model have been compared with the simulation results of basic cases. The I-O data is near to the simulation result of case one which means the model appears to be able to accurately mimic the real economy.

If optimal share is fixed at a 6% increased level from the present share of 15% for Dalia it would be 21% of the total share and this increased amount of water can increase food grain production significantly.

It can raise the GRP by 5,340 million Taka (per dry season) for Bangladesh. However, decreasing the share of water for the Gazoldoba area into 79% (from 85%) will cause a decrease in GRP up to 2,333 million Taka. Nevertheless, the GRP of the Teesta region as a whole would increase by 3,010 million Taka (optimal GRP of 241,257 million Taka – current GRP of 238,247 million Taka). The Total increase in the Teesta region is to be equitably distributed through various means, such as bilateral trade, business etc., and thus the decrease in GRP in the Gazoldoba area can be compensated to some extent.

The current number of labourers in the Dalia region is 4,318,045 persons. If the share of Dalia is increased up to 21% in dry season (which was found as optimal) it would be possible to employ up to 4,976,200 persons as labourers in this area, which would increase the total number by 658,155 persons. The current number of labourers in the Gazoldoba region is 4,294,949 persons. If the share of Dalia increases up to 21%, a decrease of 86,676 labourers would occur in the Gazoldoba target area, as in this case, the number of labourers in the area will go down to 4,208,273 persons. However, the total number of labourers for the Teesta region will go up to 5,71,487 persons, as the total number of labourers currently employed in the Teesta region as a whole is 8,612,994 persons and the number will increase up to 9,184,481 persons if Dalia gets 21% of the total flow in the dry season.

Research indicates that a labour exchange programme can balance the total labour increase in the Teesta region. If both governments accept labour transfer, new jobs can be created and there will be less unemployment in the region. This would be the optimal solution according to our research. Recently, India undertook an inter-linking river project. But in this regard, we fear that the inter-linking project will appear as a "load on a hunch back" on Bangladesh's efforts to alleviate poverty (Economic Observer, 2005), as this project will divert all the water from the Ganges, the Teeta and other rivers into rivers and canals in India.

Policy proposals regarding an Optimal Share of Teesta Water

For a better solution to the Teesta River water problem we propose the following measures:

a) An optimal sharing approach to dry-season water

The results of the simulations discussed above have given us our optimal water sharing approach.

b) Establishing a special economic block

c) Preservation of rainy-season water

d) Integrated control of flood water

e) Bilateral trade and business

To improve the lives of the people of the Teesta River basin area (both in India and Bangladesh) we also recommend the following proposals:

* During planning and policymaking, emphasis must be placed on an optimal and amicable

water sharing and on a suitable trade model.

* Bangladesh should make certain arrangements, for example, to take measures so that Indians, using the Teesta River water (at Dalia or northern districts), can get some opportunities for business and trade in Bangladesh territory;

* Joint ventures (co-project or bilateral agricultural projects) should be encouraged in establishing mills and factories (e.g. rice mills, tobacco husking mills, paper mills, food processing mills) dependent on crops produced in the Teesta region.

f) For Reducing Conflicts and for Justice

* The donor organizations should have some restrictions on the construction funds of such barrage or irrigation projects, when it has a possibility to harm riparian states.

* Both Bangladesh and India are recognised as third world countries. So both countries should try to cooperate with each other for socio-economic development, rather than engaging in different types of conflict and wasting time and resources.

* Considering the number of affected people in both India (eight million) and Bangladesh (21 million), (Islam & Higano 2000); we can say that, it would be quite consistent with the principle of justice for Bangladesh to get an equitable share of the Teesta water during the dry season.

However, we must remember that "mutual confidence and cooperation" (Wolf, 1998) between the leaders of India and Bangladesh is necessary for an economic policy to be implemented properly. Leaders of both sides have to be sincere in their efforts. They must also have an open mind and be ready to accept rational suggestions given by their counterparts to promote "Best Ethical Practice."

Conclusion

In case of implementing the Farakka Barrage treaty to share the Ganges water, we observed apathy among the parties to abide by all the conditions of the treaty. In case of the treaties to share the Teesta water, ethical points must be emphasized. We believe that political and economic solutions to the sharing problem might work, if both parties agree to abide by the "best ethical practice."

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The theoretical foundations of neonaturalistic environmental bioethics*

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I take the domain of bioethics to be the moral dimension of actions and intentions affecting vital values, or the attributes and essential conditions of being a living creature (Wawrzyniak, 2004)[1]. The structure of vital values - both organismic ones (e.g. health) and biotic community ones (e.g. eco-equilibrium) - and moral values (perhaps aesthetic ones as well) constitutes the environmental life-quality (ELQ), the essential state for life-on-earth to self-continue in the process of natural multiplication and selection.

As culture is an adapational system and the multidimensional niche of Homo sapiens, its existence depends on human observation of the standards of ELQ in the course of cultural development. The environmental perspective, having an influence on traditional bioethics for 30 years, has caused biomedical ethics, hitherto understood as the ethics of clinical practice, to acquire the new dimension of environmental life-quality ethics in the context of a revised value-status of Homo sapiens within the biosphere.

Due to its unitary – on account of axiological, metaethical and metaphysical foundations – and integrational character this relatively new discipline is called environmental bioethics. The ontological and logical aspects of the is-ought problem, the universalizability of ought-judgments, and the existence/nonexistence of natural values seem to be fundamental issues, the solution to which is crucial to the construction of global bioethics. Therefore, the axio-metaethical considerations have a special significance for the whole structure of bioethical curriculum and the basic theoretical conclusions underlie further normative inferences.

It is a methodological fallacy both to anthropomorphize natural phenomena by explaining them in terms of cultural sciences and to abuse the "anthropomorphism" argument. This charge is a common reaction to evolutionary explanations of spiritual phenomena, for humans do not accept the natural origins of their humanity. Anthropomorphism itself, as an inversion of the cause and the result, expresses the non-acceptance of the real origin of Homo sapiens. Hence, the theoretical proposal I want to sketch represents my neonaturalistic standpoint and approach to bioethical dilemmas. By restoring the full bio-cultural dimension to Homo sapiens, neonaturalism opposes both positivistic and humanistic reductionism.

An environmental ethicist looks for a set of transcendental (interspecific) values that can underlie the methodologically proper attribution of rights to non-humans and - at the same time - specific duties to Homo sapiens. However, in order to construct a verifiable normative ethic that does not commit the naturalistic fallacy, it is necessary both to find the ontological possibility for an empirical fact to be normative and to make a valuer abstract. Hence, evolutionary ethics/axiology is an alternative approach to the systems of environmental ethics based on the category of autonomous intrinsic value, of which valuableness is independent of real living beings.

If we assume that values are *ex definitione* what should (resp. should not) be, then existential value judgments (judgments of valued brute facts) can serve as necessary normative premises (resp. premises of obligation) for duty orders. Values have a status of real processual states-of-affairs, but not substances. The traditional discrimination between "being" and "oughtness" implies the mode of existence of value as a pure duty, which is an inconsistent category. That is, something is a value if and only if it is never actualized as a valued fact; so values have the paradoxical status of non-beings. (Supposing values to be ex definitione alien to facts is the petitio principi fallacy, by the way).

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1 Wawrzyniak, J. 2004. Syllabus of Classes on Neonaturalistic Bioethics – A Polish Example, in: Macer, DRJ., ed., *Challenges for Bioethics from Asia*, Eubios Ethics Institute.

Neonaturalistic ontology does away with the dichotomous division of reality into spheres of values and facts. "Duty" can only be derived from "being", or from the fact that a given state-of-affairs has been valued. I think differences in the modes of being of particular entities are axiologically relevant. Values can be made actual provided that they are understood as empirical facts. The naturalistic fallacy consists, in its essence, in setting a world of nature (resp. facts) against a world of culture (resp. values), or in restricting the realm of values to cultural phenomena.

I think the proposed approach justified in the face of theoretical troubles, which the systems of environmental ethics that are based on the category of autonomous intrinsic value (resp. inherent value) are involved in. In those systems, the duty to protect the environment depends on human recognition of the environment's own valuableness. This is an extrinsic (counter-natural in the Kantian meaning) act in relation to the environment and one that may voluntarily bind individuals but not – obligatorily - the species. The outwardness of the environmental valuableness does not oblige Homo sapiens as such to anything. In relation to the valuableness of something that is recognised as an intrinsic value, Homo sapiens remain passive receptionists but not creators that participate in this value; a human is an isolated passerby that does not have to recognise his/her guilt or duties to non-human life structures.

This paradox results from a non-evolutionary approach to the issue of natural values and human obligations toward the environment. While operating by the notion of intrinsic value, we preserve the division of being into the realm of values and the realm of facts. This conservatism (of Platonian origin) means that normative meanings are introduced ad hoc (as transcendent, but not transcendental) into the circle of human perception.

In the neonaturalistic perspective, the obligations of Homo sapiens toward the biocommunity are not facultative, but rather they arise from the evolutionarily created participation of Homo sapiens in the community of interspecific coexistence, or the biocommunity of values.

A key category - one focusing on the axiological conflict between nature and culture and one which humans used to deny to other species - is that of the "soul". Neonaturalism expounds the origins of human spiritual abilities in terms of the natural sciences, in accordance with the Darwinian legacy. Especially, I take the subject-matter of evolutionary ethics/axiology to be the natural history of moral sensitivity and value-ability (ability to value). Relevant inquiries concern the teleonomy (adaptive function) of moral sense and valuation, the functional interdependence between valuation and cognition, the range of morally relevant states-of-affairs, the explanation of differences in value preferences and behavioural patterns among species and the moral status of the cultural eco-niche of the human species[2].

Inquiring into why our culture has become a "cancer" of the biosphere, neonaturalistic evolutionary ethics recognises the feedback between poor quality of food on the one hand and brain malfunctioning, immuno-deficiency, and the pathology of aggressive behaviour in humans on the other as the most dangerous cultural phenomenon.

I take general sensitivity, or soul as the ability to perceive exogenous and endogenous stimuli selectively and to react to them functionally, or as a teleonomic structure of informational metabolism between an organism and its environment. There is the evolutionary continuity of development of organic systems of information processing.

Especially, sentience has been a pre-intellectual orientation instrument of organisms within their natural environments, as well as the sphere in which basic social ties are rooted. The more, the survival of a population depends on interindividual cooperation (resp. distance) the more significant proves to be the level of emotional reactiveness to the behaviour of habitat mates.

2 For the concept of teleonomy, see Lorenz, K. 1981. ***Foundations of Ethology***. Springer-Verlag, New York, pp. 23-35; Lorenz, K. 1987. ***The Waning of Humaneness***. Little, Brown & Co., chapter II; Lorenz, K. 1977. ***Behind the Mirror.*** A Helen and Kurt Wolff Book - Harcourt Brace Jovanovich, New York & London, pp. 21-25; Immelmann, K. and Beer, K. 1989. ***A Dictionary of Ethology*** (Harvard University Press, Cambridge, Mass., pp. 308-309.

A sentient organism is able to value, which is an instinctive reaction to empirical qualities this organism meets within its environment and which emerged under the pressure of natural selection. The faculty of valuation cannot be identified either with valuers being aware of this process or with their hedonic experiences (usually accompanying valuation but themselves being subject to valuation). Self-valuation - always present in the axiological activity of animals - is the essence of the so-called self-preservation instinct and generates (in an evolutionary consequence) the subjective experience of dignity.

Values (which is an ontic category) are inconstant (factual-processual), relational states-of-affairs, going on in time and composed of an actively valuing subject (a valuer), a valued object (that can be a living creature as well), and a relation (ontic interdependence) between them; this is every relation in which the subject wishes or does not wish - in result of valuation - to find itself with the object (or with a state it wants/does not want to participate in). The living source of valuation is an internal constitutive element of a value. Valuation itself creates valuableness (positive or negative), but not the physical existence of a value. The actualization of valued states-of-affairs is not identical with valuation but is induced by it.

But the real existence itself of anything does not make this valued. If a factually existing material set becomes valued (and called a value), its physical (ontic) status does not change; it does not acquire any new objective properties. But it becomes non-indifferent to the subject that reacts toward this set with a valuation act.

The valuableness (which is an ontological category) of a value, actively conferred on the world by creatures able to value, is the relation of sui generis emotional non-indifference of a valuer towards given configurations of empirical qualities it meets within the environment, and not a passive reception of separate value-entities. The correlation of certain configurations with valuing reactions, which motivate behavior, is teleonomic and these configurations are key stimuli releasing valuation.

Innate valuational adjustment of organisms to configurations such as vital values, or the attributes as well as necessary conditions to be a living being, are motivations inducing the defence of these values. The instinctive (apetitive-consumatory), reactional (relational) status of valuation constitutes the state of axiolocation, in which organisms must remain while fighting for survival[3]. They scour the environment for natural stimuli releasing valuation. Axiolocation make it possible for them to get oriented in the environment and creates a real hierarchy of importance among environmental elements.

Axiological reactivity is an attribute of cognitive activity of organisms in the environment. Non-humans know what is conducive or not to the quality of their lives (resp. fitness maximization) within the environmental conditions corresponding to their ecotypes. That knowledge (which does not mean awareness) is the set of phylogenic information. Together with the evolutionary complication of the conditions of survival, the significance of learning (e.g. correction of behaviour under the influence of environmental information) arises during the ontogenesis and extragenetic transfer of acquired information.

Approvals and disapprovals, which in Homo sapiens can be expressed in verbal forms, function as unique emotional prejudices (attraction or repulsion) toward valued objects. An immediate mental result of valuation is interest - which has a binary emotional-intellectual structure - in a valued object. The sensual-mental perception of data implies the subjective crossing of the threshold of unique non-indifference toward them. The apperception of information is performed by making them relevant - on the ground of valuation - in the system of a subject's knowledge. Valuation is released by the content (e.g. a vitally important configuration of environmental elements) of the stimulus.

A contact with a set of data releases their comparison - which is vital for survival and called "pattern matching" - with the basic stock of phylogenetic information[4].

Instinctive attractions and repulsions both toward signals coming from the environment and

3 For the notion of appetitive-consumatory behaviour, see: Lorenz, K., Behind the Mirror, pp. 57-62; On Aggression, chapter IV; Foundations of Ethology, pp. 5, 129-130, 189-191; 295-309; Immelmann, K. & Beer, C., A Dictionary of Ethology, pp. 18-19, 86.

4 See: Lorenz, K., Behind the Mirror, op.cit., pp. 21-25.

endogenous organismic signals and behavioural patterns (e.g. defence or escape) that are motivated by them, constitute the self-preservation strategy of existence, which includes the inclusive fitness strategy as well. Valuation stimulates the degree of caring for one's own life. The lack of value-ability, which can be called "axiological autism", would mean indifference to vitally important states of an organism and surroundings, being for a given creature a lethal defect of its informational metabolism.

Looking for the evolutionary roots of the psychosocial sphere called "morality", we have to refer to monospecific sedentary herds of non-human predators and find an instinct of social safety; there are also known examples of inhibition of interspecific non-human actions, the continuation of which would cause unnecessary death. Ethology and sociobiology provide us with examples of behaviour that can only be explained in terms of evolutionary ethics. Especially, I want to indicate an inborn faculty of ritualiazation of intraspecific aggressive behaviour as evolutionary origin of what we used to call "morality"[5].

Neonaturalism interprets moral sensitivity as a teleonomic property of living systems. There are innate dispositions to react to certain biosocial situations by definite ways, e.g. reactions appeasing aggression (by the attacked) and redirecting-inhibiting it (by the aggressor). This correlation is naturally selected. Behind particular ritualized behavioural coordinations, the moral instinct, or a genetically coded ability to control aggressivity, is hidden. Situations of jeopardy to vital values are the key releasing stimuli of this instinct[6].

Moral values are second-order values in relation to vital ones. They are practical responses to the unique emotional imperative to defend vital values. Experiencing a sense of duty can be identified with moral valuation. A vital value is the valued "object of the first level" within the structure of moral value. The second level is the process (a relation) of fulfilling the moral duty, or making efforts to protect the vital value, which is the actualization of the moral value though a vital value that was to be protected may finally not be maintained. The lack of such efforts indicates the non-existence of moral value and causes a peculiar value-dissonance called remorse, which is a function of the moral instinct. Moral values are typified by a particular motivational autonomy to be actualized. The psychological difference between vital and moral valuation is evolutionarily selected as a teleonomic phenomenon serving to protect vital values. It seems that natural selection "prepared" a double insurance of vital values by way of a typological, felt, difference between the valuation of life itself and the sense of duty to defend this life.

Moral sense is conducive to inclusive fitness. Too aggressive as well as too passive non-humans are subject to self-elimination from the genetic pool of the population. Inhibiting aggression when it is vitally necessary to be released is morally wrong. It is possible that the teleonomy of a unique moral instinct consists in regulating the inhibition-activation balance of aggressive behaviour. Presumably there is a neuro-hormonal regulation on the basic (physiological) level of moral phenomena.

Neonaturalistic evolutionary ethics suggests a homologous connection between animals' ability to curb aggression and human morality[7]. The same connection probably takes place between animal and human forms of altruism. The moral instinct can originate from either a general ritualization ability or the ability to communicate within the flock. We can also suppose that the evolutionarily prior function of ritualization as such was communication (intentional meaningful behaviour) appeasing aggression. The word "moral", in its primary reference, can denote either the application of ritualization ability to aggressive behaviour or a unique ability to ritualize aggression.

Pro-vital motivations as well as behaviours are divided into procreative, feeding, and moral by the pressure of natural selection. We cannot identify moral sensitivity with either the contents of moral

5 For the notion of ritualization see: Lorenz, K. 1963. On Aggression, A Helen and Kurt Wolff Book - Harcourt Brace and World, Inc., New York, chapter V; Immelmann, K. & Beer, C., A Dictionary of Ethology, pp. 42, 255-256.

6 I characterize the moral instinct by pointing out its natural reference and function, releasing mechanism (including unique emotional states) and some fixed behavioural coordinations. For the notions of instinct, key releasing stimuli and innate releasing mechanism see: Lorenz, K., Behind the Mirror, pp. 53-62; Foundations of Ethology, pp. 115-125, 153-184, 197-202, 268-288; Immelmann, K. & Beer, C., A Dictionary of Ethology, pp. 151-152, 251-252, 270.

7 For the notion of homology see: K. Lorenz, Foundations of Ethology, pp. 3, 85-88, 102-103; K. Immelmann & C. Beer, A Dictionary of Ethology, pp. 13, 133-134.

norms or moral behaviour itself. I understand the moral sense as the functional structure of three genetically conditioned elements:

[1] – "conscience", or a sui generis emotional imperative (a sense of duty) to defend vital values, correlated with a unique spiritual discomfort in the cases of nonfulfilment of the imperative, which is a psychological aspect;

[2] - the ability to ritualize aggression, which is a functionalistic aspect;

[3] - provital behaviour (including unconditioned reflexes), which is a behavioural aspect.

Moral sense is an instinct with an open programme of releasing stimuli and it determines, together with other spiritual abilities, complex behavioural coordinations[8]. A lot of new biosocial situations created by culture appear to have moral significance and require qualified examination. Ethics, or the science of morals, is a successive stage in the natural evolution of the moral abilities of living beings. In humans, there is the feedback of two levels of moral activity. The first level contains valuation, theoretical considerations, and decision making, the second one is an active behavioural realization of a value. If there is no proper action, a person's moral code can be supposed to be the set of empty words. On the other hand, someone who must deliberate on what one ought to do in situations of obvious moral status, that is, someone who does not show elementary animal moral reflexes is suspected of suffering moral disfunction.

The teleonomic rank of moral sense ascends together with the evolutionary development of aggressiveness, intellectual abilities, and the freedom of species, to which this sense is an instinctive counterbalance. At the present stage of evolution, moral sensitivity proves to be a decisive factor for the maintenance of biodiversity on Earth. The eco-crisis is primarily caused by the moral underdevelopment of culture, which follows from a peculiar value-aberration of Homo sapiens called speciesism and results in this species being not conformed to the ecological standards of the biosphere. Eco-shock is value-shock, for it proves that humans, just like all other living entities, must subordinate themselves to the biological order of Being. The utilitarian-pragmatic model of culture is the spiritual failure of Homo sapiens, for it has proven inefficient at the ritualization of aggression and has developed economic and political as well as mechanical and chemical sublimations of aggression. Aggression, which culture has not learnt to deal with, is redirected to the non-human environment.

Non-humans participate in freedom to a significantly lesser degree than Homo sapiens. Their actions are mostly based on innate functional dispositions, which are effective in the environments true to their ecotypes. It makes no sense to credit moral responsibility to non-humans because they are hardly capable of noninstinctive choices. Yet, they have rights, or value-interests, without duties (like Homo sapiens children have) because they embody, in their own living materiality, the transcendental vital values as does Homo sapiens.

Freedom, understood as the adaptive elasticity of a species, is made up of both the psychosomatic abilities of an organism (e.g. tool-abilities) and intraspecific individualization (particular exemplifications of free will which refined genetic programmes underlie). Natural selection has favoured spiritual adaptive inventiveness, for each successive species has found a more complicated environmental situation, where possible niches had been occupied by other specialized species. What must have emerged then, were beings capable of noninstinctive and counter-instinctive actions. These beings must have been uncommonly aggressive as well, because the growth of aggressivity is connected both with the lack of specialization, that is, with the competitiveness for every other species and with a necessity for an unspecialised species to live within a society.

The capability of free choice in the moral sphere has presumably emerged together with the genus Homo and is contributed to by the intellectual skill of theoretical reflection. Freedom has caused morality to acquire a new normative dimension. Moral responsibility could not be credited to living beings before freedom evolved. Humans themselves are responsible for how they take advantage of the spiritual

8 For the concept of open program see: Lorenz, K., Behind the Mirror, pp. 61, 64-68, 80-82; Foundations of Ethology, pp. 258, 289, 328-329.

capabilities, with which they are endowed. Human animals - on account of these capabilities - have a species-specific duty to protect life on Earth, and this is why only their behaviour can be evaluated in terms of environmental ethics. Non-humans are morally - almost - infallible, for they are - almost- not free.

In the evolutionary development of morality, we can distinguish:

(i) morally relevant objects, or non-personal life-structures like plants or ecosystems;

(ii) moral subjects, or persons (most animals including Homo sapiens), who are the subjects of moral feelings and behaviour;

(iii) moral agents (like most humans) responsible for their decisions.

Free will and consciousness do not make up the moral sensitivity as such but they do constitute moral agency. The personhood of non-human animals is actualized through sentience as well as moral and mental abilities, whereas for Homo sapiens the specificity of being a person is dominated by the component of the will.

As an unspecialized species, Homo sapiens can prey on all existing environments and this comfortable hyperconsumer position is an ecological trap. The main problem of Homo sapiens's survival is the teleonomy of limited freedom. Human's technical powers create an illusion that Homo sapiens is able to change the laws of organic evolution, while the opposite is the case. The duration of culture depends on whether Homo sapiens respects those macrolaws. Humans should not do everything they are able to and they must struggle for survival against the temptation of their own possibilities. The necessity of self-control makes the human niche morally and intellectually the most difficult among species. An adjustment of human conduct to the standards of ecological normality is a adequate challenge to the creative ambitions of the species. The novelty that human species needs to initiate within the evolutionary process is an ecologically correct adaptation of its freedom to the natural environment by means of sophisticated ethical solutions.

In neonaturalistic axiology, the active agent of valuation as well as cognition is the evolutionary transcendental (panspecific) subject (TS), or living being (resp. the intrinsically differentiated mass total of life) as such. This abstract category represents the biocommunity of values. TS is the exclusive and complete source of valuation, effecting the open programme of valuation instinct (value-ability). Owing to TS, there exists only one naturally valued world. Values are actualized and reproduced by TS, together with which the value-ability has emerged and the phenomena of formation and decay have acquired an axiological dimension. TS is an ontological as well as normative category. It also enables us to meet methodological standards that D. Hume, I. Kant, and G. E. Moore addressed to ethical claims and to warrant their biospheric validity. Thanks to the category of the TS, the value judgments (is-statements), denoting the existence of brute valued facts, acquire cognitive (verifiable) status and they can serve as methodologically proper premisses for the inference of judgments of obligation (ought-statements).

Since the TS can be understood as the genetic algorythm of life's self-continuation, this category embodies the evolutionary continuity of organic systems of information processing. TS represents a level of interspecific teleonomic knowledge (evolutionary experience of living beings) of how to act for the sake of ELQ, or the level of "logic of survival". Organisms that either do not reach or lose this level are eliminated. In the human species, this animal structure of phylogenetic information, which is the outcome of thoughtless natural selection, is supplemented by the process of learning axiological meanings in the biosphere, which can assume a form of qualified theoretical reflection. The spiritual, especially moral and intelectual, maturity of Homo sapiens makes a stage in the development of TS.

Mutual understanding within the universum of values is possible due to the biocommunity of the codes of axiological reactions. Only from the level of TS one can recognize the status of a given state-of-affairs to be contributive to global ELQ. In the course of evolutionary disapearance of the present version of Homo sapiens, a Homo sapiens moralis is emerging as the level of interspecific sympathy ergo co-valuation. The achievement of TS-level of moral consciousness is a necessary condition of ecological fitness of Homo sapiens in the biosphere. The proper function of Homo sapiens in the biosphere seems

to be the niche of moral responsibility (agency) for biocommunity survival, which implies the self-limitation of cultural development.

I take "goodness" (the positive) and "badness" (the negative) as basic non-definable categories. Real contents of "good" and "bad" (resp. right/wrong) within a given particular sphere of the environment depend on nomological standards of this sphere. Environmental conditions exert selective pressure on value-ability. The take-up of a given niche requires sensibilities adequate to the complexity of information coming from the environment. Particular species experience good and evil typical for their ecotypic spectra, especially, they are subject to influences conducive or not to the survival of a given population within a given particular habitat. Humans can value nonexisting states-of-affairs (projects). It is so because their environmental universalism and a necessity to adjust the existing environment to the needs of Homo sapiens survival are evolutionarily tied both with the driving force of prospective valuation activity and the teleological way of thinking. The level of TS covers the whole spectrum of organismic life, also the not yet existing exemplifications of it, and respects the variety of environmental contexts of valuation.

Some standards of self-preservation and coexistence - the ones that are crucial to be a living creature as such, or to preserve the structure of biospheric ELQ that is a bonum communae of all species - remain invariable. Application of these universal animal patterns (that may be reasonably modified) of coexistence - which have been spurned by Homo sapiens - to the social life of humans in cases when cultural solutions have proved to be malfunctioning is a postulate of normative neonaturalism. Especially, I mean ritualized forms of aggression, and procreation strategies. Neonaturalism takes the position of moderate (weak) environmental relativism of values, which generates ethical consequences. The imposition of moral patterns upon a given population of living beings can be lethal for them, if the patterns are generated within an eco-niche strange to this population.

Conclusions

Since the agent (source) of valuation is present in every value, then intrinsic values - if understood in the extreme realistic way as distinct qualities or separate substances - do not exist. The traditional concept of "intrinsic value" rules out the presence of a natural valuing subject (the creator of valuableness). If something is worth in itself, there is no need to value it. I propose a different comprehension of the "intrinsic". Every value is valued intrinsically, or immanently, by the evolutionary subject of life, which is its constitutive element. The "intrinsic" does not only mean "valued for its own sake", but it logically locates the valuing subject in relation to the value as well. Also the objects that are instrumentally employed (resp. extrinsic values) - as they are recognized and valued as useful by the subject - in the actualization of main purposes (resp. intrinsic values) temporarily contribute to the structure of this actualization.

The principal difference between the neonaturalistic axiology and the conception of systemic values by H. Rolston III consists in the presence of personal active agent of valuation in the former[9]. In Rolston's theory, human subjects, having found themselves within the scope of valued states-of-affairs, can discover but not confer their valuableness. The subjects themselves are valued as projective creatures of ecosystemic "axiological matrixes", but not due to their own autotelic initiative. Recognizing the biosphere as such to be value-able, Rolston takes a position of axiological preformation. Instead, neonaturalism follows the epigenetic option. The biosphere produces creatures that are value-able, but it itself does not value. Valuation had not been performed before the TS evolved and covered (retrospectively as well as prospectively) the universum of biosphere (which itself is able to be valued) with valuation. Of course, spirituality as such is one of evolutionary possibilities of life, but not predestination or an intentional product, nor the substance either. Natural selection is an impersonal process anyway.

Plants are the vegetative level of TS and a class of non-autotelic vital values. They are autodynamic, self-defending and reproducing systems of information, or the structures of life, performing the genetic programme of the good-of-their-own (resp. ecotype, telos, entelechy). They have got the status of values-in-themselves, since the transcendental subject of informational metabolism has retrospectively

9 See Rolston, H. III. 1994. Conserving Natural Values. Columbia University Press, New York, pp. 71, 81, 98-99, 171-181; Rolston, H. III. 1988. Environmental Ethics. Temple University Press, Philadephia, chapter 6.

begun - in the course of its spiritual evolution - to recognize them as the integrant part of itself. TS identifies them as the essential level of life self-continuation, particularly as a pre-emotional (pre-axiological) stage of its own development. Only through TS, plants can have their own vital interests (e.g. an access to sunlight) and be treated in a non-instrumental way.

The difference between vegetal and animal sensibility is correlated with the difference of their locomotive liberty. A tree can choose (strive for and avoid) to a limited extent. It was naturally selected as relatively passive toward environmental events that it willy-nilly experiences and is not able to foresee; the animal degree of value-ability is not necessary for it to survive. Animals, while moving within their habitats, are exposed to much more information that want teleonomic axiological (and behavioural consequently) reactions. By means of axiolocation, they actualize their ecotypic possibilities, which include the gathering of experiences (information) and transferring them - in an extragenetic way - among herd-fellows.

However, the affiliation itself of a given organism to the plant kingdom or animal kingdom is not decisive for the degree of the organism's value-ability. This ability is determined, as a rule, by environmental requirements organisms face within their habitats. One can point out the examples of both fairly mobile plants (e.g. algae) and animals that spend their whole lives in one place (e.g. coral reefs). In the main, animal organisms are selected as more valuable than plant ones. On the other hand, a degree of complexity of organisms and the scopes of their sensibilities have purely teleonomic significance and they do not generate any value hierarchy of species. Species are equally important as they constitute ELQ. As an evolutionary subject of life, TS embodies the ecological patterns of participation in the biosphere.

Taxes and tropisms of one-cell organisms and plants can be supposed as the most primary forms of pre-valuation, as well as the acts of actualization of vital values. The pre-instinctive "choices" and "avoidances" have developed, in the course of evolution, into complex (motivational-behavioural) neuro-hormonal structures of valuation. Valuation-induced behaviour may originate from the tropisms of protozoans or/ and plants. If this were not so, we could always consider analogous (functionally identical) behaviours or look for a common ancestor of plants and animals within the Protista kingdom.

Valuation (and moral sensibility as well) is an evolutionary product but not a principle of evolution; it does not change the principles of adaptation but contributes to the potency of adaptive flexibility (resp. freedom) of species. Valuation is a teleonomic way of reacting to environmental events, making it possible for living beings to conform to the evolutionary pattern of survival. TS recognizes ELQ as a structure of necessary conditions for its own existence. And the empirical macro-patterns of continuance of the biocommunity must have been valued by some its members so that they could remain in this community. The consecutive generations of living beings can continue only if they recognize ELQ (which is the state of non-intentional self-reproduction of life) as their principal value. Valuation activity - serving the adaptation of certain animal species to the non-axiological nomological order of the biosphere - determines survival.

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Can education in environmental ethics alone solve problems of loss of biodiversity in developing countries?*

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During the twentieth century – many third world countries became independent. Most of these countries had a desire to westernise – that is to develop their countries' economies and infrastructure. They modelled their development programmes on the model of western capitalist countries. But very soon many came to realise their inability to function in a modern global economic system.

Technological lag and poverty were reasons cited for their difficulties, but the real problem was with the environment and resources. It was not possible to imitate the developed capitalist and democratic nation states of the so-called developing world. It was also clear that globalisation did not bring development and prosperity to all countries. The greater part of these countries exist with low incomes, poverty, technological constraints and some are governed by authoritarian regimes.

Environmental education is an important part of education

The only comparative advantages of the under developed world – abundant human resources and new materials are becoming less important to the global economy. Global trends and powers not elected by the people will be determining factors in the national destiny of many countries.

In addition to this impasse, globalisation presents economic orientation - creating primary goods with abundant labour – and the patterns of consumption that are increasingly manifold are predominantly unfriendly to the environment. They create chaotic planetary urban expansion, causing declining yields - even in the most fertile agricultural lands. This also diminishes the supply of fish, increases deforestation, causes water shortages and consequently desertification, thereby affecting the climate with emissions of greenhouse gases into the atmosphere.

These incidents were considered to be political issues or meta-physical issues. Never was the environment interpreted within the framework of global economic relations or national problems. Only in recent decades has the world come to realise that the political economic approach with the vision of development without the environment in mind was blind.

Environmental education

Environment education according to Johnson falls into three categories: (1) the general public; (2) special social and professional groups; (3) Technicians, scientists and specialists. By and large it can be said that the protection and conservation of the environment is (according to Article 21 of the Indian Constitution) the responsibility of all the people. No single individual nor any factor can foster remedial measures for its proper protection. So it can be suggested that the three areas, namely the individual, society at large and the system of education in all its forms should contribute to the protection of the environment.

It is rather an "umbrella concept" to the protection of the environment. In short, that should become the core of the new social theory. Many scholars are of the opinion that there must be "deconstruction" of the present society wedded to development.

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So a new education is not just environmental protection - but environmental ethics education is essential to understand and tackle environmental problems. In light of the above, it is suggested that:

- The curriculum must be constructed with a definite subject and focus taking into account, the class and age of students both in the formal and non-formal system. The content at the primary stage must be easily accessible to young minds;
- The inter-disciplinary approach must be adopted at the higher level of education, creating awareness and orientation at the primary and secondary levels;
- Case studies must be constructed in identified areas such as dissertation and fieldwork reports to confirm environmental problems and research that must be conducted thereafter. Research can also be conducted on academic and social areas. It should include all living organisms;
- In research, generally educational innovation tends to flow from above, where downward flow is the sole model of innovation diffusion. But in the case of environment education it has to start from the lower level, i.e., from the teacher, this is particularly an important area where the grass root researcher is the innovator and developer who can use the environment as a basic resource for his study. For the researchers and scientists, the teacher will work as a catalyst for the successful completion of the work.

So, on the whole, for the proper protection and management of the environment, the "umbrella concepts" of education, covering all the related disciplines, spreading of curriculum adequately, using the services of all people and conducting case studies and research will to some extent serve the purpose of environment protection. Apart from this, the government should take it as a priority area, like the family planning programme and spread total literacy campaigns for proper management of the environment.

The study of the interaction between humans and the natural and social environment is called environmental education. The environment is generally taken to consist of two main aspects natural and human, i.e. human made or social. In recent years the term "environment education" has gained much popularity and the importance of the subject has been realised by researchers, scientists, environmentalists and educationalists. The scope of the environment is so wide that it covers various aspects of nature, such as ecological, cultural, technologies, economics, legal, educational and communal.

How to impart environmental education to children?

Every human being is a part of nature and whatever action he/she does will have its own consequences. Children should be given a chance to understand, love and care for nature. The teacher is the best person to induce and inculcate a sense of responsibility among children about the environment, the hazards of pollution, the interdependence of plants and animals, the care to be taken to protect the environment and similar issues, since children spend considerable time in school.

Every place and area in and around a community is fit to explore even though they are familiar to children. For example, Professor Dr. Sultan Ismail, a soil biotechnologist at the University of Madras, invited first year students to come to his institution and learn about the components of soil. Education on the importance of micro and macro living organisms and their presence for safe and healthy human living, needs to be taught to children.

A visit to a city or township can provide information about pollution caused by poisonous gases released by factories. Measures to check up on these emissions can also be explained to school children. By planting more and more trees in cities, by asking motorists to check that their engines are running efficiently and by not allowing people to burn refuse at rubbish dumps, pollution can be reduced.

Visits to local canals and rivers will enable teaching staff to explain to their students how water gets contaminated by human error. Human beings take dips in rivers to clean themselves, wash clothes and clean their cattle. All these activities pollute rivers and contaminate drinking water sources. Besides this, many factory owners indiscriminately and carelessly allow chemicals to flow into streams and paddy

fields. This destructive behaviour destroys the flora and fauna.

The importance of the social environment should also be taught to children, such as how people have changed their ways of life, aspects of socio-economic environment, the dignity of labour, relationship (spatial) between humans and their environment, the relationship between past and present humans, and to hold the past in a proper perspective, the importance of our culture and traditions. Religious values native to the nation must be taught and inculcated among youngsters especially, for example, Jainism and Buddhism that preach non-killing. Ethics must be inculcated in human beings at a very early age. If these measures are adopted, the younger generation can become more worthy and useful members of our society.

Environmental ethics education

Environmental education should be imparted into each and every citizen. Most people, including the urban elite, are under the misconception that environmental education means creating awareness among people about pollution. But the fact is otherwise. To meet the needs of the growing population, we need to develop industries. These industries are bound to release their waste in the form of effluents, which are ultimately responsible for pollution. Thus, pollution is very much an invited evil into our lifestyle.

Similarly, for achieving self-reliance and self-sufficiency in the agricultural sector, intensive agricultural practices and high yielding varieties have been introduced which in turn require very high quantities of fertilizers and pesticides. These pesticides and fertilizers can enter the water supply in either a dissolved state or remain in the soil thereby polluting both aquatic bodies and the soil. This is a sensitive aspect where even if we cannot minimise the use of fertilizers, we can still minimise pollution through the judicious use of those fertilizers and pesticides. Alternatively, we could use bio-fertilisers.

Another example is automobile pollution. This cannot be avoided totally, but judicious and conscious efforts will minimise pollution levels. Besides pollution, over exploitation of natural resources also disturbs the recharging capacity of the natural system thereby minimising the protective cover. Our development activities should be aimed at sustainable development, i.e. development without destruction.

All these things need to be dealt with in the curricula of environmental education for various target groups, where the participation of each and every citizen is essential with a responsibility for keeping our environment clean so that future generations inherit a safer environment. Nature and other living things have a right to a living.

Health consciousness through education

Environmental education can thus to be extended to all workers, industrialists, teachers, students, housewives, policy-makers and planners. The focal theme of environmental education should be the health of humans and how to make the planet more congenial to live in. The philosophy should be: "A healthy planet only can harbour healthy people."

WHO defines health as: "Health is not merely the absence of any disease, but the physical, physiological and psychological well being of the individual." The holistic concept of health can be realised only when the "surroundings" (the environment) is kept clean. To cover all sections of the populace, it needs to be implemented in various stages with various strategies, each covering a particular target group. For example, the curriculum for an industrial worker should be different from that of an agricultural labourer. Though both these target groups need to be imparted an occupational health education, the curriculum should vary depending upon their working conditions. Similarly, the curriculum should differ for industrial workers and the residents of industrial areas. However, environmental ethics programmes should be made common for all.

The government of India also has taken up programmes for imparting environmental education through the Centre for Environmental Education (CBE), the Central Board for Workers' Education (CBWE), the

Indian Institute of Ecology and Management (IIEM), etc. But these few institutes cannot meet all the requirements. Many voluntary organizations have also been working on these lines and are actively conducting environmental awareness campaigns. Voluntary organizations and non-governmental organisations have been mainly dealing with the local and regional problems.

The student community can be trained through the National Cadet Corps and National Service Scheme and can establish activist societies such as environmental clubs to create awareness and impart environmental education. They can develop an "Environmental Education" campaign, shaping it as a "movement".

Women and nature

Women are a part of the environment. Women contribute in so many ways towards environmental protection. Women's revolutions in developed countries are helping so much to protect the environment. Women, particularly those from hilly regions or rural areas, are the victims due to age-old traditional blind beliefs.

So it is needless to say these women should be educated to free them from orthodox clutches. They should be provided with proper training to create suitable awareness and an insight into the new demands in the physical and social environment. Women act as water suppliers for the family's needs, tend cattle and are the ones who use forest resources for family requirements.

So it is women who have a direct relationship that is a positive relationship with the immediate environment. In agriculture and industry, women are at the points at the lower level in all operations with water. They must be given positions in important decision making concerning the quantity of water required. Women can also control the population rate through family welfare education. The standard of life can be improved only by limiting the number of children. Women need to be exposed to the various evil consequences of population growth and the need for a small family by adopting various methods of birth control, as human beings are now increasingly considered to be natural resources.

Women are also the best agents for carrying messages of environmental protection from the public and the family health point of view. The fallout of environmental degradation and pollution have primarily affected women, because women are pivotal characters around whom the family life evolves. The female is respected as a care provider, family manager, resource person and presently even as an economic provider. The relationship between the environment and human health is an established fact. Clean air, water and soil are vital ingredients for a happy life and their abundance or paucity has a direct bearing on the quality of life of the community.

As women are in charge of the health of the family, they can be involved in all programmes, policies and legislation on housing, shelter, water supply and sanitation, including disposal of solid waste. Women are the best agents of change. They should be given extensive training in the use of domestic water requirements. They are the first teachers of human beings from the time children are born, so educating women in ethical values of the environment, would be a very important step in the direction of the preservation of natural resources. It is the best method of making children realise that humans live within the same ecological limitations as other species do. Humans love life and nature's aesthetic values that transcend economic value. That must be kindled and made to flower in young minds. Women are more capable in imparting this value.

Environmental ethics education is the key to the future

Rather than environmental education, environmental ethics education aimed at behavioural concerns must take the lead. Ethical education incorporating environmental concerns must be the core of such programmes. Ethics is the basis of society and desired social behaviour. Ethics is also the basis of law. It is easier to change the behaviour of humans in relation to the environment by appealing to morals in mankind. Humans alone, the most rational of beings on the planet, are capable of lifting themselves above the common petty qualities of human beings. Man can become godly or saintly or deify himself. To bring about changed social behaviour that has a primary concern to protect the environment,

education alone is not sufficient.

Rigorous training in the moral of preserving planet Earth should start at a very young age as part of a moral science curriculum. Thus training with incentives and punishment should continue in families, schools and communities. Converting useless laws, which are unenforceable, can go a long way in giving life to laws. The government of India and state governments should make the pollution control board responsible for direct legal action. It is not enough that they have investigatory and advisory legal powers only.

Until now, there are only limited administrative mechanisms to punish violators. Environmental law is difficult to enforce. An industrial capitalist who is also a technical expert can be appointed in a government sector industry in the same area. It is natural that the government would not be interested in taking penal actions against the erring industry.

It is also cheaper for the defaulter to pay lawyers to delay cases than comply with the requirement of the law. It is much easier to get away with continuous defaults when people are ignorant of what should be done.

Voluntary organizations and non-governmental organization's active and keen assistance must be sought by the government, along with agencies dealing with water and soil protection to assist self-help groups in training people on values of bio diversity.

The governments have to constitute Institutes of Limnology for most of the states and adopt surface water bodies of a specific size, take care of primary life forms (phytoplanktons) and water can also be taken underground and stored in aquifers or water bodies and then supplied to the public. More bird sanctuaries with adequate safeguards in coastal eco-systems can save the bird population from becoming extinct.

Through intense education and appropriate policy, such as the above examples, we can move towards proper respect for the environment and real protection.

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Inculcation of environment-friendly ethics as a prerequisite for sustainable development in Bangladesh*

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Introduction

Degradation of the environment and its restoration has become a common concern in our world. Policy planners today cannot take environmental issues into account. Instead of aiming at "development" per se, they are now speaking of "sustainable development". How can "sustainable development" be made possible? Amongst many facets of answering this question, comes the issue of development and the application of ethics that would encourage policy planners, implementers and the general public to think, behave and act in environment-friendly ways.

This paper emphasizes the fact that environmental ethics must be inculcated within the mental set up of individuals and groups if we expect them to act in environment-friendly ways at all levels – as an individual, a guardian, a policy planner, an implementer of policy, an administrator, as a member of the legislation, or as someone holding some other position. In doing so, it reflects on the definition of environmental ethics; the meaning of sustainable development and the concept of sustainable living; major environmental factors in Bangladesh in her march towards development, and the ways in which environmental ethics can be inculcated within the mental set up of the people of Bangladesh so that they always behave in an environment-friendly manner, ensuring "sustainable" development.

Environmental ethics

The term "ethics" refers to the moral principles that guide the behaviour of individuals and groups. The concept "moral" is concerned with the judgment of right or wrong and good and bad. Moral principles are formed by human attitudes and values that are internalized by an individual through his/her personal realisation and the socialization process.

Values in a society specify duties and obligations, norms and permissions; they determine when and how individuals/groups are to be blamed, praised or be held responsible; and when, what is to be regarded as valuable. Values set a standard for assessing peoples' behaviour. Indirectly, values provide means of assessing actions and regulations of governments as well (Jamieson, 1993).

"Environment" means "something that surrounds." The totality of the environment includes natural and cultural elements. However, in defining environmental ethics, the term "environment" usually refers to the non-human natural environment. "Environmental ethics", therefore can roughly be defined as the "human attitudes and values that influence individual behaviour and government policy toward nature" (Callicott, 1995: 676). "In general, environmental ethics is a systematic account of the moral relations between human beings and their natural environment." It is assumed in environmental ethics that moral norms are able to and actually do govern human actions towards the natural world (Jardins, 2001:11). This is very important in ensuring that our future generations will have a chance to live peaceful and prosperous lives, to enjoy all the amenities offered to man by mother nature. However, in this paper, "environment" is referred to in the totality of the term, including both natural and cultural elements.

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Environmental ethics can be divided into two categories: (1) anthropocentric and (2) non-anthropocentric. Anthropocentric environmental ethics considers the non-human natural world as a whole to a means that serves human ends (Callicott, 1995). It assumes that only human beings have moral value. Thus, although humans have responsibilities regarding the natural environment, they do not have direct responsibilities to the natural world (Jardin, 2001). Therefore, it can also be regarded as ethics "of human beings for the use of the environment" (Mitra, 1997: 25). Non-anthropocentric environmental ethics, on the other hand considers humans and non-humans as parts of the moral universe, both having intrinsic value.

Humans therefore, have responsibilities towards their own species, as well as to all other non-human entities of the natural world (Mitra, 1997). Non-anthropocentricism has various forms, namely, biocentrism — the life centred approach, eco-centrism — the ecosystem-centred approach, moral pluralism, deep ecology etc. Norton (1987) suggests that instead of taking the trouble of delving into rather an unfamiliar and unending domain of non-anthropocentrism, we should broaden our conception of human welfare we receive through nature. For example, humans not only get material goods (timber, water, food, energy etc.) and services (water purification, crop pollination, oxygen replenishment etc.) from nature, the uninterrupted natural environment ensures the aesthetic, psychological, spiritual, religious and scientific well being of human beings.

Clean air, water, open spaces, diverse landscapes, wilderness playgrounds, green belts etc. provide important human amenities. Preservation of all the species or life forms, instead of allowing them to become extinct, will provide scientists with "important subject matter for pure, disinterested human knowledge" (Callicott, 1995).

This particular category of environmental ethics is termed "prudential anthropocentrism" or "enlightened anthropocentrism" (Brennan and Lo, 2002). Some philosophers have doubts regarding the convergence hypothesis of Norton and do not agree that anthropocentrism is philosophically defensible. They also argue that although anthropocentrism and non-anthropocentrism might support the same environmental policy, the ways they support it is totally different. Anthropocentrists always are concerned about instrumental values of the environment for the betterment of humans, while non-anthropocentrists are more considerate in serving the interests of nature itself. While for the arguments made in this paper, in our opinion, it is not really necessary to go beyond the realm of anthropocentrism (as visualized by Norton), it seems unethical to deny intrinsic value of non-human natural objects.

Sustainable development

The concept of "sustainable development" was coined to insist that decisions made at all levels within society must take into consideration their possible effects on the environment (Marshall, 1998). The concept of 'carrying capacity' is related to the concept of sustainable development that determines the number of people who can be supported on a sustainable basis within a region at any time considering the available resources and socio-cultural factors. Taking carrying capacity into consideration, the most widely cited definition of sustainable development was given in Our Common Future by the World Commission on Environment and Development: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The report continues: "Sustainable development requires meeting the basic needs of all . . . meeting essential needs requires not only a new era of economic growth for nations in which the majority are poor, but an assurance that those poor get their fair share of the resources required to sustain that growth." In this definition, two aspects are to be noticed: (1) consideration for the future generations; (2) equitable distribution of resources among the developed and the poor countries and making sure that the poor in the poor countries get their fair share. Thus sustainable development requires that a balance is maintained through mediating between socioeconomic and environmental needs and can be defined in the following way:

> "A continuing process of mediation among social, economic and environmental needs, which results in positive socioeconomic change that does not undermine the ecological and social systems upon which communities and society are dependent. Its successful implementation

> requires integrated policy, planning, and social learning processes; its political viability depends on the full support of the people it affects through their governments, their social institutions, and their private activities (Christie and Carlie, 1992: 48)."

In the definition given above, we find that the whole value system of a society (which supports and tries to implement the ideals of sustainable development), and the environment-friendly ethics upheld by individual members are very important if sustainable development is to be attained. If the people concerned are not conscious enough and do not uphold the value of saving the environment and do not feel themselves ethically responsible to act according to those values, sustainable development would only remain a dream. Hence ethics provide the structure on the basis of which institutional, legal, and other aspects of sustainable development should be built (Earth Dialogue, 2002).

Sustainable development encourages productive activities which would maximize social welfare but would not contribute to the depletion of the resource base for future generations (Sadeque, 1992); it requires that development planning follow the principle of minimizing wastage, minimizing generation of pollution, and maximizing recycling (Moniruzzaman, 1997). In doing so, it is a prerequisite that policy planners, implementers, and the beneficiaries thereof adhere to ethics, which have commitments towards protecting the environment, and which are based on equity and justice. Without implanting these ethical principles within the habits and practices of the people, the goal of sustainable development would not be possible to be achieved.

As a step towards sustainable development, the concept of "sustainable living" was introduced during the 1990s. The term has been defined as:

> "… a new way of life and approach to social and economic activities for all societies, rich and poor, which is compatible with the preservation of the environment." (Kato, 1994, as quoted in Murcott 1996: 2).

Ethics identified by Murcott as compatible with sustainable living are:

> (1) To refrain from killing;
>
> (2) To treat and value all natural and cultural systems that support us as possessors of their own intrinsic value;
>
> (3) To consume only to such extent that is necessary to meet one's basic needs. Any surplus should be used for the purpose of ensuring justice and equity for the current generation as well as for generations to come;
>
> (4) Keeping in mind that humans and nature cannot be separated, "nature", should be studied with "a deep sense of humility and wonder and the tools of science and technology must be used for the well-being of humans and nature" (Murcott, 1996: 4).

Development and environmental issues in Bangladesh

Development in Bangladesh is taking place mainly in three ways—(a) modernization of agriculture, (b) industrialization, and (c) urbanization. Development efforts in Bangladesh have had a great impact on the environment. As the population is growing at a high rate, there is no other way but to emphasize increase in agricultural production, to meet the basic necessities of the people. Naturally, overuse of natural resources occurs. Rahman and Huq (1994) have developed a schematic representation of the linkages between environment and development (see Figure 1). The interaction between environment and development takes place within the context of the population concerned and the natural resources that are available. The principal issues that are related to the environment and development in Bangladesh are the following:

> (1) **Population growth:** The increasing population (135 million with a growth rate of 1.8%) creates constant pressure on natural resources, generates pollution and contributes to the degradation of the environment;

(2) **Natural hazards:** Floods, cyclones, droughts, river erosions etc, damage to infrastructure, houses; ruin to crops and livestock;

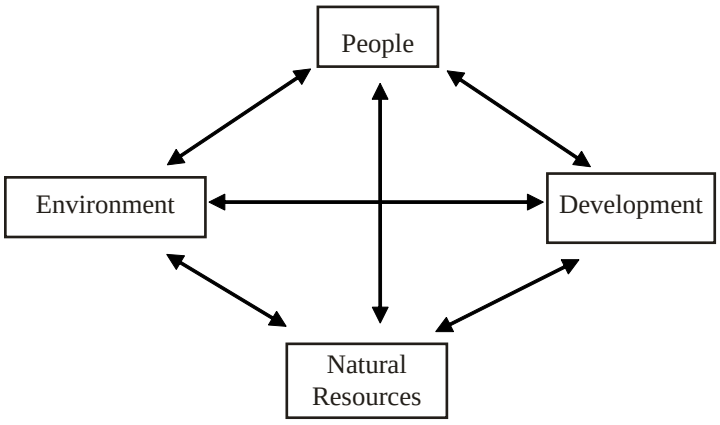
(3) **Changing patterns and overuse of land:** Intensive cultivation, faulty management practices and improper cropping cycle cause depletion of soil fertility. Bias toward High Yielding Varieties (for rice) is replacing some traditionally adapted and resistant species, which in turn requires an increase in the use of chemical fertilizer and pesticide (Rahman and Huq, 1994).

(4) **Improper use of water resources:** Bangladesh is a deltaic country. Many rivers originating in the Himalayas end in the Bay of Bengal flowing through Bangladesh, carrying a lot of silt into this delta. Excessive water in these rivers during the rainy season causes floods. Lack of water in the dry season (often due to unilateral withdrawal of water upstream at that time) results in droughts and contributes to lowering of the water table as farmers are bound to use ground water for irrigation in that situation. Meanwhile, a shortage of water in the rivers causes the saline belt of the country to encroach from south to the north (Rahman and Huq, 1994). Water in Bangladesh is being polluted in three forms: (a) faecal pollution; (2) industrial pollution; (3) agro-chemical pollution.

Structures built for flood control drainage and irrigation have the following consequences: (a) Siltation of river beds; (b) disturbances in navigation systems; (c) decreased flood plain availability for fishery by restricting their migration and spawning grounds.

(5) **Depletion of forest resources**: Although a region/state for healthy living is supposed to have 25% of its area covered by forests, Bangladesh has only 14%, according to government sources and only 6% to 8% according to non-government calculations (Nishat, 2001).

Environment and Development Relationship
(Source: Rahman and Huq 1994)



(6) **Unplanned urbanisation:** Urban areas in Bangladesh are expanding very fast and as a result of increasing landlessness, rural to urban migration is continuing. These people come to the cities with the hope of finding work. However, the necessary preparation for accommodating such huge numbers is not undertaken, which results in increasing slums and squatter settlements. Nowadays, urbanisation is coupled with "industrialisation".

(7) **Non-environment-friendly industrialisation:** Although Bangladesh is predominantly an agriculture-based country, some industries have developed, albeit without taking environmental issues under consideration in most cases. Pollutants discharged from the industries include ammonia, chromium, mercury, phenolic effluent, colour and foam, toxic gases, dust, solids and sludge etc. (Omar, 1998). Development of industries without taking environmental issues into concern has caused quite a few environmental problems.

(8) **Air pollution:** Air pollution is a phenomenon of mostly the urban areas, where motor vehicles run abruptly. Sufficient control is not imposed on the emission of deadly gases through these

vehicles. Moreover, poisonous gases are also released into the air from brick-fields and other industries. Air pollution in Dhaka city is noted as one of the worst in the world. Polluted air can cause asthma, headaches, eye irritations, throat pains, anemia, heart disease, mental disorder, kidney trouble, and even cancer (Hossen, 1998).

(9) **Noise pollution:** Noise pollution is another characteristic of city life in Bangladesh. Motor vehicles, industries, horns and the use of loud speakers are the main sources of noise pollution. Although, the highest acceptable noise around hospitals and educational institutions is 45 decibels, a survey reports that the lowest noise in these areas was 53 decibels, the highest creeping up to 83 decibels exposing people to the risks of hearing disorders/deafness, mental illnesses, heart attacks etc. However, this is totally a problem, which can be kept to an acceptable level if the people concerned are conscious and willing to solve the problem (Moral, 1998).

(10) **Sea level rise:** As has been mentioned above, Bangladesh is still at an initial stage in terms of industrialisation and hence one of the countries least responsible for the green house effect, which contributes to a sea level rise. However, minimal sea level rise is likely to put the people of Bangladesh into jeopardy, as more than half of the area of Bangladesh is situated less than five metres above the sea level (Moniruzzaman, 1997). Under such circumstances, a study carried out by Huq, Ali and Rahman (1994), depicted the possible consequences of a one metre sea level rise on Bangladesh: displacement of more than 11% of the population; 17.5% (25,000 sq. km) area will be totally inundated; Mongla port (a major one in Bangladesh), 85 cities and towns, 4,200 km of coastal embankments, 28km railway and over 800km of roads will be flooded; The Sundarbans (the largest mangrove in the world) is likely to be threatened with extinction; coastal islands with an area of 3,500 sq.km are likely to be inundated; three million acres of land which produces 16% of the total rice production will be lost; coastal shrimp production that earns millions of dollars would not be possible at all. Abatement cost for minimum protection against a one metre sea level rise was predicted over one billion US dollars (at the rates of 1994). Current estimates are more than tenfold that figure and difficult to comprehend or accurately contemplate.

Inculcation of environmental ethics

Ethics are embedded in the value system of a society. A baby after being born learns how it is supposed to behave, what is right, what is wrong, etc. Thus the way in which environmental ethics is inculcated within the individual is the same way as the individual is socialized. The primary agencies of socialization are the family, peer groups, education, religion, and nowadays the mass media is playing a significant role in socializing. Now we will discuss these in detail.

The family: Usually, a baby is born to a family. Its first socialisation takes place within this primary group. It learns to do things, first of all from its mother, and also from its father, siblings and other members of the family. When a baby is given the ideas of "right" and "wrong", it is important that a baby learns the ways he/she should interact with the environment. In this way it is possible to inculcate environmental ethics that will make an individual behave and act in environment friendly ways, from the very beginning of his/her life. For example, when a child notices that its parents and elder siblings care about trees and plants, avoid the wastage of water, follow the habit of recycling, etc, the child is very likely to acquire these qualities within himself/herself. Parents can teach their children how important the environment is for all of us, and the ways in which we can protect it.

Peer group: Beyond the realm of the family, an individual learns from different situations that he/she encounters within his/her peer group. Approval of peer group functions is a significant motivating factor in one's social behaviour (Popenoe, 1971). If any one member of a peer group acts in an environmental friendly manner, others are also inspired. The sharing of information occurs among peer group members in an informal fashion, which has a long lasting effect on the formation of environmental friendly habits. Thus if a person is conscious about the environment and has a sufficient influence, all the other members are also likely to follow him/her.

Religion: Religion is a social institution that forms the core of the value system of an individual/

society. More than 85% of the people of Bangladesh are followers of Islam. It is said in Islam that the environment is one of God's creations, and as his representatives, humans have a duty to preserve it. Man must be kind towards all that has been created by God on earth; the plantation of trees is encouraged and the destruction of fruit-giving trees and crops is forbidden, even during a time of war. Religion forbids waste, calling someone who wastes "a brother of Satan". Cleanliness is a significant part of the Islamic faith. The relationship between all the creations of God must be based on justice and equity. Justice is to be maintained for the people who are alive today and for those who will come to live on earth in the future and for this reason the environment must be protected [Deen (Samarrai) 1990).

The Hindus are second largest religious group in Bangladesh. According to Hindu scriptures, man receives a lot from nature and has a responsibility to pay back nature by protecting the environment. (Mitra, 1997).

Often because of their ignorance, people are not aware of these sayings of religion that emphasize protection of the environment so much. As the people of Bangladesh are known to be peace loving, pious people, they can easily be motivated to behave in environmental friendly ways through religious leaders. The ministry of environment in Bangladesh must make use of such an effective agency to convince people regarding the ethics they must up hold to save their mother Earth. People can also learn about these words of religion from their families and friends.

Education: Education is another social institution, which implants ideas of morality into an individual. Aspects of moral judgments, which may not be learned within the family because of lack of knowledge of its members, can be learned through education. The realm of education is very vast — a person can learn from schools/colleges/universities, as well as from books, mass education programmes, special education programmes etc. A student takes his/her teacher as a role model, and often follows his/her teachers' instructions more keenly than instructions given to them by their parents. The curricula can be set in such a manner so that students may grow to be environmental friendly people. Side-by-side the real situation in society should be such that people can apply what they learn as morally right and wrong regarding their interaction with the environment. For example, people may learn that they should not use fuel wood for cooking; but if the actual situation is such that there is no alternative fuel made available for them to use, this learning is not going to be applied.

The mass media: In today's world, the mass media is playing a greater role in informing mass communities of matters of which they were not aware before. The mass media has been very successful in Bangladesh in motivating people to immunize their children, and to plant trees and take care of them. Environmental issues can be introduced to the people in a manner, which is very much appealing to them. Big celebrities can come forward in getting messages across to the public, which would tell them what they should do and what they should not do.

We are mainly concerned with the application of ethics for sustainable development in Bangladesh in this paper. However, it is not only the ethical values and action of people in Bangladesh that is responsible for the environmental degradation that takes place in the country. For example, the people of Bangladesh are the least responsible for the emission of CFCs that causes the green house effect. However, this is likely to affect Bangladesh severely within less than half a century through a sea level rise. Therefore, it is necessary to think holistically and to see ourselves "as part of a single moral community that is global in scope and extended in time". We must also be "mindful" in all our acts.

The things we are doing today, thinking as "innocent acts" are not innocent when done in concert (Jamieson, 1993: 325). We may think driving a car is an innocent act, but when everyone in a country drives a car, collectively, this helps to deplete the ozone layer significantly. There are countries, which are thinking of imposing an emission tax to discourage the emission of carbon dioxide gases. However we argue that imposing these taxes is not going to help in the long run, unless people are ethically convinced.

The onus is on the general public to take the responsibility to save our planet for future generations. We must share resources in such a way that future generations will be able to continue to develop so

it is possible for them to act in a holistically, environmentally friendly manner. It has been observed in a study by Bohm (2003) that environmental risks, which are caused by the cumulative actions of many people, "carry the highest potential for acceptance of personal responsibility" by individuals. In order to make people conscious and active regarding their responsibilities towards the environment, this type of risk should be highlighted.

Conclusion

Our aim in this paper has been to emphasise that unless people are ethically motivated towards a sustainable livelihood and realise the importance of preserving the environment, sustainable development will not be possible. In this connection, the main focus of the paper was on the ways in which environmental ethics can be inculcated within the mindset of individuals that can in turn ensure their actions in an environmentally-friendly manner. Our point here has been that sustainable management is of course necessary for sustainable development; however, it is not sufficient. If the environmental ethics suitable for today's needs and for the future can be inculcated within all individuals, and if they feel responsible for preserving the environment for the sake of themselves as well as future generations, the task of making development efforts "sustainable" will be much easier. Ethics for the preservation of the environment should be upheld by bureaucrats, development planners, politicians and by the public in general. It is only this innate urge to save our Earth that we can ensure environmentally friendly behaviour by all.

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Applying ethics in a professional context: What can we hope to solve?

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Introduction

In 2004, UNESCO hosted a series of meetings to develop universal bioethical norms, the rationale for these meetings being insidious global environmental degradation; at the April 2004 IBC meeting in Paris, development of ethical norms was differentiated into two initiatives: human ethics (which was erroneously termed bioethics) and environmental ethics (dealing with the non-human aspects of our biosphere); I opposed this division, on the basis that humans are of, rather than distinct from, the biosphere; however, the decision to pursue this approach was defended on the basis that any holistic approach would be too complex, and would take too long; twelve months on, we have moved to develop separate protocols, although these are not, as yet, endorsed. I perceived three broad groups of issues that currently face humanity, resource focused, anthropocentric and environmental:

Resource focussed:	**Anthropocentric:**	Environmental:
- overpopulation	-terrorism and war	-sea-level change
- hunger	-equity	-climate change
- energy	-equality	-pollution
- over-consumption	-demography	-pestilence
- trade barriers	-justice	-GE
- education	-freedom	-biodiversity loss
- non-sustainable:	-corruption	-fresh water
horticulture	-poverty	-loss of ozone
fishing	-fundamentalism:	-tectonic activity
agriculture	sectarian	
	secular	

These are compounded by uncertainty regarding the nature (i.e. mechanisms and rapidity) of climate change, the political (and economic) effects of endorsement of protocols such as Kyoto, (including the acceptance of deals for "emerging" economic giants such as China). There is still the widening gulf between the rich and poor nations, the latter often beset by poor governance, high population density, poverty and poor human rights, the former by unsustainable demographic change, security and diminishing strategic resource supply (e.g. water, petrochemicals and electricity). Professionals in any society are those individuals who are fortunate enough to have a higher education. It is clearly the responsibility of this group to take even greater initiatives to solve global issues; scientists and engineers alone will not solve many of the current problems, but we can, and must, ensure mechanisms for dialogue exist whereby we can draw upon the very best skills available to solve crises, for whether or not we may wish it, we are now in crisis mode.

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The legislative framework

Although there are a number of pertinent conventions and protocols that have had wide international endorsement, only two are considered here.

International Convention on Biodiversity (CBD)

Since its inception in 1992, the CBD, originally agreed to by 188 nations, has still only been ratified or acceded to by 168. Notable exceptions are Japan and the United States of America. Irrespective of this however, there are two aspects of this convention worthy of consideration, as the convention makes it explicit that:

- Ratifying States are expected to pursue their own environmental law policies.
- And Ratifying States are not permitted to damage the natural environment of other states.

The first is effectively a caveat permitting nations to pursue activities, such as whaling for scientific purposes, which are clearly anathema to others. Thus the convention permits sacrifice of endangered taxa rather than the impugning of national sovereignty. The second aspect is somewhat naïve, in that almost all human industrial activities will have environmentally deleterious effects… and these will ultimately be global effects. It is more appropriate to view nations as part of a global common, rather than as a series of closed systems.

The Earth Charter

The Earth Charter forms the underlying rationale for global sustainable development. The final version was approved in 2000 at UNESCO Headquarters, Paris. There is a wide range of issues within this document; some are likely to be implemented by most countries in the short to medium term, others are less likely to be, e.g:

1. A selection of principles likely to be implemented in the short term (the numbers preceding each principle are those from the Charter):

5.c. Promote the recovery of endangered species and ecosystems;

5.e. Manage the use of renewable resources such as water, soil, forest products, and marine life in ways that do not exceed rates of regeneration and that protect the health of ecosystems;

7.c. Promote the development, adoption and equitable transfer of environmentally sound technologies;

Not surprisingly, these are likely to be implemented because they make sound economic sense. Indeed, it is economics that is often a first consideration, rather than ecosystems.

2. A selection of principles which are unlikely to be implemented in the short term:

6.e. Avoid military activities damaging to the environment. (there are few, if any, military activities that are not environmentally deleterious);

7.d. Internalize the full environmental and social costs of goods and services in the selling price;

10.c. Ensure that all trade supports sustainable resource use, environmental protection, and progressive labour standards;

Again and not surprisingly, these are not likely to be implemented in the short to medium term because they do not appear to have short to medium term economic validity. Further, they are also seen as infringing national sovereignty.

A flaw in human systems is an inability to reach wide consensus on "values", even those concerning globally significant issues, such as the protection of endangered species. This aspect is particularly important when a choice is required between the following:

- loss of biota versus loss money (i.e. financial loss)
- loss of endemic taxa versus loss of non-native taxa
- loss of biota versus degradation of human life

Ultimately this must lead to the question: "Is there any situation in which a human life should be sacrificed to save a species?"

Bioethics – reflections on recent developments within UNESCO

"Bioethics" was coined in the late 1960s by Van Rensselaer Potter (1988); it represented a new discipline, and a new world view that originated from a clear certainty that unless humanity did something about their environment, then survival was unlikely. Importantly, van Potter saw bioethics as pertaining to more than many do today, i.e. he defined it as:

> "Biology combined with diverse humanistic knowledge forging a science that sets a system of medical and environmental priorities for acceptable survival." (van Potter, 1988).

In April 2004, the International Bioethics Committee (IBC) met at UNESCO House, Paris. One of the purposes of this meeting was to develop universal norms for bioethics. Presumably these norms were to form the basis of protocols for individual/corporate/national/international action to arrest environmental degradation.

Bioethics revolves around both human-human interaction, and human-environment interaction. Many participants at the IBC meeting thought that most concepts in the former of these, such as "human dignity" would be readily adopted within any set on "universal protocols". However this was not to be, as, for example, the Japanese delegation, led by Professor Ida, advised the assembly that: "...Human dignity is a Western concept... that is difficult to define (from a Japanese perspective)". (National Bioethics Council of Japan Submission to IBC, 2004).

Again we find that the fundamental obstacle to consensus on a global scale is cultural. Without deliberating on the merits of any particular stance, however, it is clear that bioethics largely remains in the social realm, and as such is not as definitive as many scientists and technologists might desire.

At this IBC meeting, the original concept of bioethics was vigorously challenged, with the extraordinary outcome being that the term bioethics should no longer have broad application, but should applied specifically to ethics directly pertaining to humans, i.e. human medicine, human genetics, human nutrition etc. When challenged on this change, the official UNESCO response was that to pursue bioethics as Van Potter envisaged was impracticable, due to both the complexity of bioethics (sensu lato) and the tight time constraints currently upon us (Buckeridge, 2004).

As a consequence the natural environment was somewhat marginalised at this meeting, although a new, independent group was set up under the auspices of the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), to evaluate the potential for international action in the field of environmental ethics. In particular, this group was to determine whether any universal norms for environmental ethics could be established.

The first stage of this strategy was to set up a panel of environmental ethics experts. This panel of eleven was subsequently charged with addressing the following: What is the current status of environmental ethics? and, what are the possibilities for international action in this field? COMEST's "Panel of Environmental Experts" first met in Paris, France, 23–24th September 2004, and then in New Orleans, USA, 18-20th November 2004. A draft policy document derived from these meetings was circulated to members of the Experts Panel later that year (COMEST, 2004), with responses/feedback due by January 2005. The work on environmental ethics was placed on hold in 2006-2007 by the COMEST bureau and

the UNESCO work plan, but returned as a theme in 2008. I am very pleased to learn of the efforts for consideration of ethics of energy technologies and environmental ethics in UNESCO.

Throughout the two workshops, the COMEST panel considered initiatives to build capacity (particularly at local level in developing nations), and to raise broad international awareness of the ethical issues pertaining to the environment as key strategic aims. It was agreed that it is unlikely that science and technology alone will solve conundrums of environmental ethics, the rationale for this conclusion again being the importance of underpinning values – values that are cultural, and that are rarely universal. Interestingly at the first meeting in Paris, there was no clear vision of exactly how environmental ethics should be defined. In light of this, an Environmental Ethics Workshop was offered at the International Zoological Congress in Beijing (in September 2004); the deliberations at Beijing (and subsequently from seminars and workshops that I hosted in Australia, Germany, New Zealand, Norway and the United States) resulted in the following definition, which has now been sent to COMEST for consideration:

"Environmental Ethics is a philosophy where humanity is taken as part of (rather than separate from) nature, and where humans adopt a responsible, compassionate and empathic environmental stewardship through which they do not needlessly exploit or destroy organisms or the habitats that sustain them."

The COMEST will need to address this definition when it takes up the issue again. The approach adopted throughout the 2005 COMEST's Expert Panel draft document is passive rather assertive. This may be a strength, as it is less challenging to those in authority who should adopt the protocols. However, it is also a weakness, as it allows the same individuals or groups the luxury of obfuscation. For example, how can anyone make a valid, qualitative assessment on whether a state/corporation/individual has paid "special consideration to sentient beings"? (Section 2.1.1). Just what is "special consideration"? e.g. the realignment of a €1,000,000,000.00 motorway, or intent to produce an inventory of selected taxa?

Again, we return to the pressing need to establish universal values… whilst around us environmental degradation gathers momentum. An important observation is made in this regard under Section 2.1.6 (Principle of natural resources as global commons), where obstacles to the Earth as a global common are seen as unfeasible in the absence of any international agreement. It is stated however, that "the ethical idea of a common moral responsibility towards natural resources could nevertheless be promoted and proclaimed." (COMEST, 2004). Although use of the word "could" in this context is fascinating.

The most valuable recommendation made by the draft document is reinforcement of the need for more education about environmental issues. When there is a degradation of the environment, we need to be very aware that it is an ethical issue. Practitioners also need to be reminded that ethics are underpinned by values… i.e. values that particular societies (or powerful elements within societies) have agreed to, and have been implemented to ensure survival of those societies. (Buckeridge, 2002).

What is the next step?

From an individual's perspective, or even from that of a small state, it is easy to adopt an approach along the lines adopted at the 2004 IBC meeting: that the environment is too complex and there is too little time save it. Parties may also conclude that their input is so insignificant on a global stage that any behavioural change they may make is worthless. However, most of us are very aware of the tragedy of the commons, and in light of this, we can but conclude that inaction is an abrogation of our responsibilities as stewards of the planet.

Education must begin with the individual, ensuring greater environmental awareness; importantly, the need for an environmental ethic must underlie the very fabric of our lifestyles. Perhaps it is firstly of value to consider those elements that we, as individuals can expect to have some control over. For those beyond the individual, we have the power to inform, persuade and in some cases demand action.

From the COMEST panel meeting, and other workshops, it is possible to identify three broad groups of issues that currently face humanity, those that are resource focused, anthropocentric and environmental:

Resource focused:

To change some of the ways in which we use and manage resources is very much within the capacity of the individual. For example, we may choose the manner in which we use energy, the techniques we employ to farm, to fish and to grow crops. We also chose as individuals how we manage highly modified systems, e.g. with regard to non-native species that are perceived as a threat to the natural environment. From early analysis, one could conclude that exotic species are detrimental to an ecosystem. However, this is challenged by Sagoff (2005), who asserts that non-native species quickly become an integral part of the natural system: i.e. he concludes that exotics make an important contribution to biodiversity richness. Sagoff is not endorsed by all scientists, but his challenge reinforces how incomplete our understanding of natural systems still is. Indeed, humans have an unusual rôle to play as a species, firstly as the most aggressive "exotic" coloniser of natural systems on the planet, and secondly as self appointed stewards of the natural environment. Nonetheless, any affirmative action (from an environmental perspective) must be on an informed basis. This underlines the need for, and the value of education.

There are other elements here however, which are generally beyond the influence of the individual, such as hunger, and trade barriers. Appropriate management of these is the substance of good government. In addition, there is still the widening gulf between the rich (= developed) and the poor (= developing) nations, the latter often beset by poor governance, high population density, poverty and appalling human rights, the former by unsustainable demographic change, security and diminishing strategic resource supply (e.g. water, petrochemicals and electricity).

Anthropocentric:

These issues are intimately associated with the manner in which we live – i.e. they are issues that are derived from the values of societies. These can be expected to have a strong cultural basis (and bias), and as such are generally beyond the ability of individuals to influence (e.g. secular and non-secular fundamentalism, terrorism and war, equity, equality, justice, freedom, corruption, poverty, demography). To manage these elements in an environmentally benign manner requires a high level of international co-operation, which is ultimately underpinned by a need for more equitable sharing of the earth's resources. Unless there is a dramatic and rapid downturn in the health of the biosphere (i.e. where humanity faces a common external threat, rather than inter-human strife), the latter has little likelihood of short term success.

Environmental:

In general these issues are beyond the scope of individuals, small states, or even large nations to change (e.g. sea-level change, climate change, pollution, pestilence, effects of genetic engineering, biodiversity loss, supply of fresh water, depletion of the ozone layer). What is required here is concerted international co-operation, but even if this is obtained, it may be generations before we can expect reversal of current trends. Further, some "environmental issues" are neither anthropogenic nor able to be altered by human activity (e.g. tectonic activity, solar activity, changes in the Earth's magnetic field). In these situations we can simply hope to effectively respond to phenomena. This requires planning, and of course education.

Ethics as part of the university curriculum

A professional is one who accepts responsibility for the effects of his/her actions. But responsibility is taken one tangible step further for professions such as engineering, for under the legislative infrastructure of most countries, a professional engineer is accountable. Indeed, it is this accountability that provides the strong financial incentive for engineers to do the right thing. A wide adoption of this model was not taken lightly: the engineering profession saw a code of ethics as fulfilling a very real and precise need.

Since the mid 20th Century, many technological (i.e. engineering) advances have resulted in degradation or destruction of natural systems; it is this environmental damage (and the blame apportioned to technologists), that led to a drop in public confidence in engineering. Public confidence is simply a measure of trust, and without this trust, a profession has no mandate (Buckeridge, 2002).

Thus a code of ethics is, in part, a deliberate move to counter a growing lack of public trust. The widespread adoption of more rigorous ethical protocols by engineers, and the accountability that this entails, has significantly improved the public image of that profession. The natural sciences could do much worse than emulate the engineering model – not least because they are no longer publicly "invisible". The general population is more educated, and informed, than ever before. Of course scientists could well adopt a *laissez-faire* approach, i.e. wait and see what happens, but we should be mindful of recent initiatives by European Union leaders such as British Prime Minister Blair, who in 2004 stated in the *Times Education Supplement*, that bioscientists should move to regulate their discipline (from an ethical perspective), "or it may be done for them".

Curriculum content

It is not the intention of this paper to provide an in-depth guide to what should be included in a "Professional Practice Course" for scientists, technologists and other professionals. There are however, some ethical components that would be desirable in any course (Buckeridge, 2004).

These include:

- An historical overview of moral theory. [This provides necessary intellectual foundation from which future ethical decisions may be made].
- An overview of extant codes of ethics in related disciplines. [This lends itself to strong utilisation of case studies: i.e. what happened? and why? Then reflection upon how a similar situation should/could be handled.]
- Analysis of the reasons why a code of ethics is necessary, with discussion on the role that scientists and other professionals are likely to adopt in the future, including widespread endorsement of the concept of sustainable resource management. [This provides the opportunity to discuss the concept that "one solution invariably will not suit all" – cultural sensitivity, and special needs are developed and analysed here.]

Epilogue

There are some very persuasive indicators that we are entering a bleak period for the Earth's biosphere. At the same time there is still widespread uncertainty about what sustainability really means. There are too many politicians who pursue economic goals at the expense of all else. The engineering profession has taken a laudable lead in trying to instil appropriate values into the engineering curriculum, in anticipation that new graduates will more fully appreciate the effects of their activities, including issues such as social justice. There is now an urgent imperative to ensure that other professions and disciplines adopt a similar approach, permitting an opportunity for senior undergraduates to reflectively evaluate the Ethical, Economic, Environmental and Engineering systems in which they will ultimately function (i.e. the "Four Es"). In addition, all professions and disciplines must be proactive in the pursuit of continuous professional development; for it is only through this mechanism that sustainable resource management can be instilled into all facets of human activity.

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Awaiting liberation of animals from experimental clutches*

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Introduction

In recent times biotechnology has been a most controversial scientific discovery due to its potential good and bad effects on the ethical and social aspects of human beings. There are innumerable biotechnical, agricultural, industrial and medical applications such as the acceleration of breeding techniques, adjustment of new pharmacodynamic agents, construction of new organisms with useful qualities and clinical applications to control diseases (Ignacimuthu, 2002). Biotechnology has revolutionised the medical field by providing new and efficient tools to combat diseases.

Human insulin, interferon, monoclonal antibody and growth hormones are some examples. Many new chemicals such as amino acids, vitamins, enzymes and the biological molecules are available in greater amounts. In spite of all these, most pharmaceutical and chemical companies will direct their research only towards profit, forgetting human dignity.

Life on this planet is a finely tuned delicate balance of all forms of life a balance created by millions of years of evolution. Animals are being used for genetic engineering, for use as models of human diseases, for use in the production of useful substances such as proteins for medical use and in the moral traditional uses in agriculture. Some of these uses, such as the production of mutations in strains of animals to study human diseases will have a human benefit; but are more ethically challenged because some of these strains may be deliberately made sick and will therefore probably feel pain. Lower vertebrates and invertebrates are generally placed at the lowest end of the "Scale" of ethical status, because the only internal character they have is the state of being alive. External factors form a human aesthetic view point mean that the only argument usually applied to them is human utility.

Human encroachment on the natural world made the life of animals terrible. The 1990s can be rightly called as the age of exploitation – an age of embarrassment. We have gone astray with a civilization of human primacy which caused great suffering to billions of animals in factory farms, laboratories, marine world "attractions", circuses and similar places.

The explosive development of transgenic science is the ultimate exploitation of animals. Those gentle creatures that are labelled as farm animals are now being further "pharmed" through genetic engineering, causing them to suffer from a wide range of deformities. Genetically altered laboratory animals are also being subjected to many invasive experiments. An awareness of these facts can perhaps shock us into a painful reality that calls for urgent reaction (Singer, 1985). In order to reduce all exploitation of animals we have to concentrate on animal experimentation and the use of animals for food.

Animals as tools for research

More than 1.5 million mice, rats, pigs, livestock, poultry, domestic animals, native animals and primates are used in research in Australia each year. There are some 45 million rats and mice used in laboratories each year in the United States alone. Animal based scientists have brought many benefits to animals

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and people. It is true that often, but not always, the animals involved experience pain, suffering or other harm, even when great care is taken to avoid it or minimise it.

The application of the "Three Rs Principle" of replacement, reduction and refinement in the research will surely achieve the most good with least harm. Careful application of this principle ensures that animals are only used when non-animal alternatives are not suitable (replacement), that only the smallest number of animals required to achieve the aims of the work are used (reduction), and that if any pain or suffering is caused during the work, it is kept as low as possible (refinement).

Factory farming

Among many victims of artificial mutations farm animals suffer the most. In the United States every year, over three billion chickens get raised in factory farms, stuffed into crates on the backs of trucks and then hung upside down on conveyor belts that take them to slaughter. For their entire lives, these farms animals are locked inside factory warehouses and manipulated by machines as if their sole purpose is to be harvested by man.

They never have a chance to see the sky or smell the earth. They can never experience the pleasure or the freedom of living beings like our pets or wildlife. Farm animals are subjected to lifelong abuse by the most atrocious appalling manipulation invented by the agribusiness sector. Their utter misfortune is caused by being labelled as food animals, but they are still sentient beings not so different from human beings.

The super pig, a product of genetic engineering, is a sick animal, genetically manipulated by inserting genes for producing human growth hormone. The so-called "super pig" must endure side effects including crippling arthritis and distorted vision caused by the human growth genes that make them cross-eyed. Pigs are being modified with human genes so that the organs of their offspring can be transplanted into humans. Soon in addition to factory pig farms, there will be pig organ farms. Are farm animals not part of the animal kingdom sanctified by nature?

Xenotransplantation

The last hundred years has witnessed many attempts to carry out animal to human transplants – all have failed. Pigs are now being genetically manipulated to carry human genes in the hope that this catalogue of failure and misery can be turned into a viable medical treatment. Thousands of people are on waiting lists for human organs. Does xenotransplantation offer the real hope, or might it be one of the greatest medical disasters of all time? Should xenotransplantation ever become a reality, pigs will be turned into spare part factories, plundered for their organs. Genetically mutated and raised in artificial conditions, these remarkably intelligent animals face an unnatural and distressing existence. Other animals have been subjected to horrific experiments, including the grafting of hamster hearts into rabbits, pig hearts into monkeys. Many of them have had to be destroyed soon, after receiving "foreign" organs because of their immense suffering (Brown and Duffus, 1984).

One further problem is that pigs have a kind of retrovirus which cannot be claimed to be from the pig because it is inherited in the pigs DNA yet can come out as an infectious virus. At least three strains of pig retrovirus can propagate in human cells in culture, therefore there is a risk that they could infect humans and might cause disease in humans.

Xenotransplantation is intrinsically immoral in terms of its exploitation of non-human animals. Animals such as pigs have a vital interest in avoiding suffering and fulfilling their desires and instincts not to be killed. Their incarceration, the frustration of their natural instincts as a result of their housing conditions and their destruction all represent fundamental abuses of their moral right to have their vital interests respected. We conclude that the use of pigs for xenotransplantation may be ethically acceptable. We conclude further, however, that the acceptability lies in balancing the benefits to humans against the harms both to the pig and to humans (Haring, 1975).

Animals under the knife

With advances in genetic science, animals can now be bred to develop tumours or other diseases for scientists to experiment on. The ethics of animals suffering in the name of research sometimes depends on the likelihood that the research will contribute to reducing human or animal suffering. Some animals are involved in the low impact observational studies, but many are in the front line of research into diseases such as cancer, AIDS, Alzheimer's and Parkinson's diseases. The sacrifice of animals has been vital to the development of vaccines against mumps, rabies, polio and measles. These days, as genetic technologies develop, increasing numbers of animals are having genes structures altered in the hope of finding cures to some of humanity's most intractable diseases.

Cloning

The technique of cloning or asexually producing duplicate copes of individuals is another facility offered by biotechnology. It is now within the capability of scientists to remove or destroy the nucleus and human zygote and replace it with a nucleus from the somatic cell of any individual male or female and re-introduce the zygote into a woman in whom it will develop into a human baby that will be an exact replica of the donor of the somatic nucleus. The plot of the aged millionaire persuading doctors to clone several copies of himself by transplanting the nucleus of his cells into fertilised eggs and then implanting them into women remains a pure fantasy.

Cloning is a clear case of manipulation of human genetic endowment. It will also tend to undermine marriage and the family by severing the bond between marital love and procreation; it would render the male unnecessary as far as procreation is concerned and give rise to serious problems about personal identity and individuality. Furthermore cloning will produce a monotonous world of identical individuals. It will also diminish the chances of natural selection and genetic variability which are the very foundations of species diversity.

Two years after Dolly the sheep came named Cumalina and her clones (two generations of cloned mice), the scientific world and commentators were ecstatic. The researchers behind Dolly the sheep let it be known that they had launched a joint venture company with half a dozen lines, everyone of which was expected to spawn a multibillion dollar industry. Mass produced, identical mice for animal experimentation, cows with a human gene to produce human blood, pigs with a human gene to produce human tissue and possibly human organs for transplant, human embryo to produce an "almost human" for experimentation. The lack of ethics and morality will come as no surprise to seasoned observers of agribusiness of which the biotech business can be seen as a constituent part. There were important genetic failures and problems encountered included:

- The super pig engineered with a human growth hormone gene was arthritic, ulcerous, blind and impotent;
- The super salmon engineered with grow faster genes from another fish had a bulbous head and died as a result of not being able to see, breath or feed properly;
- Clones of Dolly the sheep, "the big success story", are eight times as likely to die at birth compared with normal lambs;
- The genetically modified food supplement L-Tryptophan is believed to have caused at least 37 deaths in the US and left 1,500 permanently disabled;
- Genetically engineered soil bacteria that dramatically inhibited the growth of wheat seedlings.

Conclusion

Technical innovations and their possible repercussions require ethical reflection on what it means to be human. When we are involved in research, we should guard and protect life and contribute to human dignity. The preservation of human life and the environment in the present and future must be the supreme motivation of all research. The goal of biotechnological research should be to preserve, protect and revere life. The exploitation of animals by humans should be minimised.

Animals escaped the tsunami fury that hit Asia and beyond because they have an ability to sense subsonic waves from an earthquake minutes or hours before a tsunami strikes the shore. We have many questions to ask. Who is superior – animals or humans? What have we lost? Our modern lifestyle has broken our roots with mother Earth. Should we not change our lifestyles at least now? What is happening to our universe?

It is time for us to give the non-human organisms their own rights and to protect them with much care, and provide properly their needs. We can do this in the following ways:

- By giving the animals fresh water and the right food, in the right amounts at the right time;
- By keeping them in a place which suits them well and in this way minimizing for example, exposure to extreme weather or physical discomfort;
- By watching for signs of ill health or injury and getting veterinary help when necessary;
- By giving them appropriate exercise and, when appropriate, the company of animals of their own or another type;
- It is necessary to breed animals which tolerate particular environments, are less susceptible to disease and are more at ease when managed by people. Let human organisms enjoy their rights fully.

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Observations on environmental ethics, animal rights and culture

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Introduction

In recent years, society has become more complex and it is more difficult to know what is actually going on. Most people receive news knowing what is happening in our society through the media. However, in terms of solving problems, such as environmental issues, just receiving information and knowing the issues would not have a great influence on people's minds.

Actions aiming to deal with these issues are less likely to take place. Consequently, a change in society to resolve the problems cannot be expected. In the light of this point, the idea that being aware of an issue would count greatly in order to make people motivated to act would be predicted. Therefore it was considered to be helpful to study the individual awareness and actions derived from the awareness.

To begin with, research was conducted with animal rights movements and ecological groups. With regard to their two main features: (1) both animals and environmental issues are close to our life and; (2) their real situations are hardly recognisable for most of the people unless they are engaged in relevant work. For example, animals are largely associated with our life mostly as a food source. Also pets are becoming increasingly common in Japan. However, it becomes suddenly invisible when it comes to the negative side. Despite the close relationship with animals, as stated above, very few people face the scene where animals are killed in food processing, or abandoned pets are taken to the animal shelter prior to being euthanized or used as experimental animals for research.

Environmental problems also feature in the same way. Although it is widely relayed to the public through the media that the environment surrounding us is degraded, most would not be able to recognise environmental degradation.

Knowledge and action on environmental problems

According to surveys conducted by several research institutes on environmental issues, most results showed a large number of people were concerned with environmental issues. In a questionnaire conducted with 377 business workers by an insurance company (Sumitomo, 2000), 90 per cent of respondents expressed an interest in environmental issues. In another survey conducted by an advertisement company (Dentsu, 1991) with 1000 people, aged from 15-59 years, concern about environmental issues ranked at the top among several social problems. About 80 per cent were aware that they are damaging the environment and are responsible for this.

These surveys indicate the gap between those who have knowledge and how to deal with the problems. Although environmental protection has become a common idea with Japanese society it seems it is still having a difficulty understanding how to implement environmental protection and how serious environmental issues are.

Resolving problems – what drives people to their actions?

I suggest knowledge of these issues would hardly drive people to solve the environmental problems. Another consequent question, therefore, needs to be addressed: "What makes people take action?"

To study this, the questionnaire and interview surveys were given to those who have joined animal

rights movements, mainly focusing on: "What made you take part in this movement?" From the results, a survey was conducted by Ki-Li Watkins. The interview survey was also carried out on 20 youths, aged 18-27 years old, involved in environmental education.

The results revealed two factors behind the decision making. First, was the experience that appeared from the data. It revealed many of those who joined these activities had a special past experience with animals or environmental issues. For example, an animal rights activist said it was because he often encountered pets abandoned near his home. The results of the surveys on the youths were quite similar to those of the animal rights movement organisers. Some of them experienced the destruction of a forest near their homes when they were young. Another person was a farmer and he said he was devastated by climatic change.

By facing a real situation, in other words having a real experience, these people became clearly aware of climatic change, problems facing animals, environmental degradation, etc. Therefore, I would like to suggest that "learning from real experience" is an important factor. In addition, this is not only for the animal rights and environmental issues, but also can be applied to make an ethical decision on a different theme.

On the other hand, not all people have had these special experiences with animals or environmental issues, of course. It is suggested however, there was another factor that could be counted as an answer to the question. In summary, the number of people who had real experiences is around 30% of all responses, and an interesting point is that most of the rest of them experienced the grass-roots activities on these issues. Some responses indicated that because of participation in a grass-roots activity they have started to work on these issues. It can be inferred that by participating in these activities, their knowledge for issues would become clear and concrete understanding as well as awareness and action be provoked.

Conclusion

There have many suggestions from this study and some of them need further exploration. Among them, particularly, I would like to discuss mainly grass-roots activities. A basic point is to know how much these grass-root activities can contribute as a provider of "the real experience". As stated before, the real experience affects one's mind or behaviour than learning basic verbal or visual styles as a lecture usually does. Also it should be taken into account that people can learn how to deal with problems through participation in grass-root activities.

The grass-roots activities are seemingly the most desirable places to provide this kind of learning in Japan. For an example of this, an NPO is working on delivering the knowledge of popular science technology so that the public can be close to what is happening in new biotechnology and medicine and they can make their decision without being confused. The NPO is striving to engage the public and researchers by holding Bio-café lectures which is to talk about recent topics in biotechnology in an informal manner.

Several research centres organise visiting tours in order that ordinary people will be able to gain an insight into what is actually going on at the real research places. Sometimes working together, they are encouraged to establish a style of learning.

Overall in Japan, it is felt that this interaction and collaboration is spreading. However, it is felt that this "wave", making collaborative work with other sectors or people, still needs to be considered in many aspects to provide a stable platform.

Communication and dialogues would have an important role in part. It also should be considered how to process this collaboration. Nowadays the idea of Sustainable Development (SD) is becoming increasingly common as a goal which needs to be achieved. A collective body of different sectors, and decision-making through communication and mutual understanding would be a great tool towards this goal.

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Whose critical engagement for eco-bioethics in the Information Age? Communication, logics and strategies of NGOs in ecological modernisation*

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Ecological movements and bioethics in a globalising World

Free and timely flows of capitals and goods across borders are becoming an integral part of the global economy – globalisation is the main force in shaping our world destiny! Thanks largely to information and communication technologies (ICT) in developed economies, productivity growth has accelerated almost everywhere since 1995 (The Economist, 25.October 2003, p.74), and ICTs became the functional necessity for socio-economic development

But the globalisation processes are not a smooth, voluntary and benign one; more often than not, they are full of contradictions, confusion, chaos and power struggles. Globalisation processes are problematic and tend to polarise the socio-economic life chances of people – this has been confirmed by the Report of the World Commission on the Social Dimension of Globalization (WCSDG 2004). Two contesting views on the globalisation project: globalisation is regarded as a benign and automatic force that fosters better economic benefits for everyone, even the poorest group can be better off. This is in strong contrast to the political extremes of the Left and Right, that for the Left: unbridled capitalism does produce effects of exploitation of the weak and socio-ecological degradation, and for the Right: the malignant forces of globalisation engender xenophobia, demising local people's jobs, culture, language and hence identity (Milanovic 2003).

Globalisation processes, hence, have put state and society in a very peculiar position, as both are exposed to the challenges of "external" forces: capital, goods, labour (and jobs) are more mobile than the previous regime of global order. Against this trend, non-governmental organisations (NGOs) have been championing the alternative way of modernisation, sometimes raising the fundamentals of bio-ecological ethics.

At this historical conjuncture, we are entering a new era of digital economy, polity and society, thanks to modern ICTs. Participatory politics on a global scale seems more and more possible, allowing most forms of communication: one-to-one, one-to-many, many-to-one and many-to-many. The maximum utilisation of ICTs enables electronic mobilisation; hence cyber-activism has become revolutionary in changing the mode of interaction for advocacy and empowerment, power relationship between the state and people and the governance structure (Lai 2004a, Schuler & Day 2004). Take the Association of Progressive Communications and its Asian partner, South Korean Jinbo.net, for example: they are international networks of civil organisations for social justice and development, active in mobilising progressive forces for regional and global activism in labour, human (animal) rights and environmental movements alike, in both cyber and real spaces (Hick et al. 2000; Hick & McNutt Eds. 2002; http://www.apc.org/; http://www.jinbo.net).

The key issues here are the opening up of potential for transnational activism as far as interactivity, timeliness, active participation and progressive agenda setting are concerned, both in virtual and real political communities. Saskia Sassen rightly points out that globalisation and the new ICTs have enabled

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a variety of local political actors to enter international arenas once exclusive to national states. Multiple types of claim-making and oppositional politics articulate the global agenda. Going global has been partly facilitated and conditioned by the infrastructure of the global economy, even as the latter is often the object of those oppositional politics (Sassen 2004: 649).

The synergy of global bio-ecological movements and ICTs can be understood, analytically, from three distinct yet inter-related debates on the governance of, and participatory politics in, the global system (Lai 2004a). They are: the Globalized Space thesis of James N. Rosenau (1997, 1998), the Cosmopolitan Democracy concept developed by David Held (1995, 1998, 1999), and the Transnational Advocacy Networks (TAN) thesis of Margaret E. Keck and Kathryn Sikkink (1998, 1999).

Confronting globalisation and the problematic of global governance, Rosenau (1997,1998) rightly identifies the nascent social agencies, networks and actions: NGOs, the internet and social movements respectively. As it is widely agreed upon that current existing global governance is largely undemocratic, possibilities for democratizing these structures needs to be discussed – an issue which Dryzek approaches discursively arguing that "democratic action in the international system is rooted in reflexive control of the prevailing balance of discourses" (Dryzek 1999: 43) and that deliberation or communication is the central feature of transnational democracy.

Despite regional differences regarding the interconnectedness of the Internet, the creation of Cyberspace through the integration of ICTs locally and globally has been extending the way, mode and form of communications, doing-business and policy-making, with emerging new and distinct (cyber) culture, (virtual) community and (virtual) reality.

In the Globalized Space, local, regional and global ICTs are referred to by James N. Rosenau (1997, 1998: 46-7) as one of the functional equivalents of democratic governance where transnational issues are beyond the control of nation-state nor the state-sponsored institutionalised regime, like the UN:

> "The widespread growth of the Internet, the World Wide Web and the other electronic technologies that are shrinking the world offers considerable potential as a source of democracy... by facilitating the continued proliferation of networks that know no boundaries; these technologies have introduced a horizontal dimension to the politics of Globalized Space. They enable like-minded people in distant places to converge, share perspectives, protest abuses, provide information and mobilize resources – dynamics that seem bound to constrain vertical structures that sustain governments, corporation and any other hierarchical organizations" (Rosenau 1998: 46).

On the transnational "activism front", e-mobilisation (which is one form of cyber-activism) revolves around the strategic use of the new media by NGOs. E-mobilisation occurs within the cyberspace in form of virtual communication between activists using various means, such as fax and short-message-sending (SMS), e-mail, web pages and hyperlinks (Brecher, et al. 2000: 83).

The notion of "electronic mobilisation" (i.e. democracy aided by ICTs) is in line with the theory of 'Cosmopolitan Democracy' of David Held (1998, 1999), in which he argues that, in a world of overlapping communities of fate, Cosmopolitan Democracy is the creation of new political institutions and a diversity of NGOs in global civil society, with the democratic principle and praxis of broad access to avenues of civic participation at national, regional and international levels.

Critical engagements of NGOs: articulating bio-eco-ethics by PeTA

Global movement and local protests undertaken by global and local NGOs are phenomenal these days: questioning stem-cell research, against animal rights abuse, against GM foods, the bioethics of transnational corporations (TNCs)….All these are integral to issues for human sustainability, the risk society and the search for ecological modernisation (Beck 1992, 1998; Mol & Sonnenfeld, 2000).

The "Battle in Seattle" (demonstrations against the 1999 WTO ministerial meeting) marks the beginning of a new epoch of global activism, aided by ICT in general and mobile communications in particular.

Since then, global activism has shaped the location decision for international finance institutions (IFI) meetings, like the World Bank and IMF, attempting to move away from cities and transportation hubs. Yet, e-mailing or increasingly mobile phone text messaging has become a central tool for the e-mobilisation of global social protests against capitalist globalisation.

Just before the Seattle meetings, about 1500 of non-governmental organisations (NGOs) had signed the anti-WTO declaration using e-mails and SMS text mail (Bennett 2003; Brecher, et al. 2000; Held & McGrew 2002). The more recent example is the global peace campaign against the American "imperialist" calling for war against Iraq: with the full-fledged utilisation of ICT, the Internet/Web and mobile multimedia, over 12 millions of protesters were on the march in hundreds of cities around the world on 15 February, 2003.

All these global activisms are facilitated by mobile communicative networks The Net /Web and mobile communications therefore give leverage to ordinary people, resource-poor activists and protest agencies to fight against the establishments - governments, big businesses and the media. All kinds of "anti-information and ideas in cyberspace, bypassing the mass media, turned into global real time social actions".[1]

Below is the specific contextual discussion revolving around bio-ecological issues issues, as articulated by transnational advocacies networks (TANs), presenting the case of PeTA (People for the Ethical Treatment of Animals, http://www.peta.org/) and the related advocacies.

PeTA's movement strategies in perspective

PeTA, People for the Ethical Treatment of Animals represents such endeavours in challenging the predominant pro-growth, unsustainable development. PeTA, a single issue (animal rights) international non-governmental organisation (iNGO) found in 1961, is a worldwide movement of people who campaign for animal rights. PETA believes that animals have rights and deserve to have their best interests taken into consideration, regardless of whether they are useful to humans. Like you, they are capable of suffering and have an interest in leading their own lives; therefore, they are not ours to use, for food, clothing, entertainment, experimentation, or any other reason. (http://www.peta.org)

PeTA's work is based on careful research and on the standards agreed by the international community. It is independent of any government, political ideology, economic interest or religion. The main work of PeTA is carried out by volunteer activists, members and supporters. PeTA mobilises volunteer activists — people who give freely of their time and energy in solidarity with animals they believe have been abused. In 2007, there were more than 1.6 million members, supporters and subscribers in over 150 countries and territories in every region of the world. Despite the cultural and geographical diversity of PeTA's activists, with widely different political and religious views, they are united by the determination to work for a world where animals enjoy their rights, parity to human being, too.

With more than 1.6 million members and supporters, PeTA is the largest animal rights organisation in the world. It focuses its attention on the four areas in which the largest numbers of animals suffer the most intensely for the longest periods of time: on factory farms, in laboratories, in the clothing trade, and in the entertainment industry. It also works on a variety of other issues, including the cruel killing of beavers, birds and other "pests" and the abuse of backyard dogs. PETA works through public education, cruelty investigations, research, animal rescue, legislation, special events, celebrity involvement, and protest campaigns.

PeTA is one of the few groups that works as a de facto monitor for global animal rights conditions and perhaps, the only people movement for animal rights advocacy and promotion, following PeTA's principle (- though which is debatable and contestable) of bioethics. Recognising the achievements of the extensive work in the field of animal rights protection, PeTA has been endorsed by international communities of intellectuals and progressive people, as they have been supportive in campaigns such as "Fur is Dead", "Vegetarianism", "Anti-Animal Testings", "Cruelty to Accompany Animals" and "Animals

1 Details of the anti-globalisation protest networking, see: www.indymedia.org, and www.wtohistory.org.

used for Entertainment". (http://www.peta.org/mc/photos.asp).

Over the last decade, PeTA international has campaigned for animal rights, questioning the conscience of people regarding biodiversity and animal rights, ranging from "Fur is Dead" to "Vegetarianism" and challenging animal testing by scientific communities. Unlike other NGOs which focus solely on the welfare of people, it has been a people movement agency for animal rights, therefore it puts animals first.

Hence, communicative work is the main battle field for PeTA, such as information gathering, disseminating action oriented information for global mobilisation, informing the global media, exerting pressure for political leadership / international organisations with morally grounded animal rights appeals, etc.

PeTA reports carry a ring of authority because the information is correct, true and timely, with no discrimination on grounds of race, religion, or ideological belief. More importantly, PeTA's deliberate strategy for the investigation of animal rights abuse and the related campaigns by "outsiders" – the strategy of global campaign and local action is the modus operandi of PeTA.

As information and knowledge are crucial to PeTA's critical engagements in animal (and human) rights movements, I will outline the use of ICTs and the formation of TANs as PeTA's global-local strategy for its intervention in animal rights abuse and the advocacy for animal rights.

Whenever there is a report of animal rights abuse. PeTA searches out the facts. PeTA mobilises local informants, or sends experts to conduct field investigations, observe and record the abuses. It also monitors thousands of media outlets and maintains contact with reliable sources of information all over the world. The research is carried out by expert staff, supported by specialists in a range of fields such as international law, media and technology. After detailed, yet timely fact-checking, whenever PeTA establishes that immediate action is needed to protect those whose rights have been abused, the group mobilises members, through its extensive communication network.

With an established case of animal rights abuse that requires immediate "saving" action, PeTA initiates its global network to challenge the abuse, with various forms of mobilisation, ranging from a five minutes individual action such as: (http://www.peta.org/actioncenter/getactive-5min.asp):

- Writing to the producer of any TV show in which characters abuse or ridicule animals, and dash off a letter to the TV network that airs the show as well;
- Writing a brief letter "with a point" to the editor of a newspaper that runs an ad for a fur sale;
- Calling the sponsors of upcoming entertainment events that use animals, such as circuses and rodeos (look for ads in your local paper);
- Including a PeTA leaflet with every bill paid, and placing an animal rights sticker on the outside of the envelope;
- Putting pressure on teaching staff to stop schools keeping animals in the classroom or requiring students to dissect;
- Promoting beauty products that are not tested on animals;
- Asking for more vegan options at local restaurants and grocery stores;
- Including an animal rights quote or web link to an animal rights video in email custom signatures

And in the community:

- Buying animal rights books to donate to local libraries. Visit PETACatalog.org to purchase select books for libraries at a 20% discount;
- Wearing clothes and buttons with pro-animal statements is a great way to be an advocate for animals who are exploited on factory farms. Our "Ask Me Why I'm Vegan" button is a great conversation starter;
- Posting PETA literature on bulletin boards (it's free!);
- Offering to show videos, sponsor speakers and host seminars;
- Taking vegan meals (and recipes!) to functions;

- Getting active on food committees;
- Speaking up! When people ask you why you don't eat animals, don't just call it a "personal choice". Instead, paint a vivid picture of cruelty and explain how easy it is to go vegetarian!;
- Lending animal rights books to friends and placing them in the library of retirement homes, schools, churches, or synagogues.

Or alternatively, for those individuals with more time to commit: (http://www.peta.org/actioncenter/getactive-15min.asp):

- Keeping eyes and ears peeled for animal-related issues and writing a letter in support of animal rights to the editor of every magazine or newspaper;
- Thanking publishers and producers for animal-friendly messages on TV and in print;
- Writing letters to companies that conduct cruel experiments on animals, such as Iams and its parent company, Procter & Gamble;
- Calling and writing to legislators asking them to support animal-friendly legislation;
- Perusing the local newspaper for "free to a good home" ads and calling the people who place them, warning them that their animal might end up in a lab. Ordering PeTA's "free to a good home" ad pack;
- Giving others a message when they leave one for you! Recording an animal rights message on your voice mail or answering machine, such as, "Millions of animals die every hour in the United States for their flesh".

For urgent issues, online activism is obvious (http://www.peta.org/actioncenter/online-activism.asp). This sort of mobilisation is parallel to other international NGOs' mobilisation, such as that carried out by Amnesty International (2004, Lebert 2002). Yet, what distinguishes PeTA from other international NGOs' e-mobilisation strategy is its soft, down-to-daily-life activities of do-it-yourself.

Championing for new bioethics: Becoming animal rights cyber-warriors

Cyber-activists for animal movements have their uniqueness, as well as similarity, with other social movement activists in the cyberspace mobilisation.

The above PeTA example highlights the communicative aspects, identity and praxis, of Cyber-Animal-Rights-Warriors in action. For the transformation of everyday life by/with the cyber-dynamics, within and beyond the e-mobilization for bio-ecological justice, four major processes have transpired as critical. First and foremost is the new self-identity formation (with and through individual actions), within a wider context of global/regional green-animal-rights political lobbying (the otherness).

Cyberspace provides good information with hyper-links to other sources of information and it is a relatively safe haven for people to have imaginative and innovative encounters with global policy problems. Under the previous regime for animal rights politics, it was not possible for a wide range of people to be actively engaged in activist campaigns.

They were confined to learning about it from the conventional media. The cyberspace (for novices as well as veteran activists) is a learning-by-doing, action-oriented media at both individual and collective levels. They act with just a few clicks, sending support and appeal letters or animated e-cards to the targets. Hence, the bioethics (green) charged, finger-tipped, motor-skilled actions onto the keyboard and clicking the mouse of the individual constitute a new green identity of, as well as praxis for, involving in global bio-ecological movements and hence becoming a cyber-animal rights warrior.

Second, and in relation to environmental politics that used to be characterised by local, regional and national political processes, focusing on the right or wrong of the binary code of bioethics and eco-justices, the ICT enhanced cyber-cum-social mobilisation extends the territorial (ir) relevance and enables "outsiders" to have an influence in and beyond the locally and regionally specific, territorially defined, environmental struggles.

Within and beyond the transformative cyberspace, the "outsiders" are inherently bound and structurally anchored onto/into ecological movements and therefore acquire the identity of "insiders" or at the very least, an empathetic actor/supporter for victims of environmental disasters. Hence, the bio-eco-ethics movement articulates and reinforces the bondage between human agencies and the animal world, juxtaposing the higher level of global concern into national/regional/local sustainable spaces.

Third, the multiple linkages of cyber-networking and the offer of the alternative lifestyle of PeTA, as a representative for NGOs globally and locally, through vegetarianism and no-fur clothing, in and beyond cyberspace stretch geog-cultural localities and they also extend to numerous individuals who used to be passive observers (of the mass media) and call upon their participation in a less militant, yet supportive, role for the sympathetic alternative lifestyle movement.

Here, individuals can make a difference in global sustainability, for animals in particular, especially on those issues (animal and human rights) normally neglected by the present state system. At this historical conjuncture of informational development, the everyday life green-and-for biodiversity praxis (of a few mouse-clicks) is not just transforming the greenness of one's identity (its relationship with the natural world) but also reshaping the relationship between oneself and the otherness (animal world at large).

Finally, the cases of cyber-activism mentioned here, point towards the emergence of a new socio-cultural charged eco-green identity, and bioethics, within/beyond cyberspace, extending the opportunity structure for daily life praxis – cyber-activists have a role to play! Cyberspace reinforces the civic forces not just for animal rights per se (the solidarity movement between human and animal worlds of various forms) and extends the horizon of ecological action – possibly keeping the ecological issues/calling alive even when the social movement (in the real world) become dormant at the local level. The struggles against animal abuse, as in the PeTA case study, highlights that this ICT enhanced mode of advocacy and their multiplying effect towards a new form of not just communicative identity of the cyber-warriors but extending the spaces for bio-ecological governance and the rainbow praxis for sustainable development.

Like other TANs, with the use of web-page action call, e-mail, fax, mobile phone short-message-sending, the power and response time, rate and volume for transnational activism on animal rights protection has been substantially enhanced. Undoubtedly, ICTs and TANs enable PeTA's members, supporters and staff around the world to mobilise the public to put pressure on governments and others with influence to stop the abuses, as well as fostering animal friendly consumption behaviour.

Timeliness, responsiveness and interactivity for animal rights protective actions and mobilisations (against animal abuse) become the signature tactic for PeTA. This has been much attributed by the formation of TANs and more recently aided by ICTs which keep animal rights issues "hot".

Paralleling the development in e-commerce, e-government – the animal right's movement takes a cyber-turn too.

For PeTA, its international website (http://www.PeTA.org) provides animal rights resources on the Internet, enabling people to take action to prevent abuses. The website contains contact details for different offices and languages sites worldwide, with links to other animal rights-related websites. More resources are available as the PeTA movement goes on. Undoubtedly, all these will serve a new (cyber-) space for animal rights advocacy, campaign and promotion on various geo-social scales, in different countries and cultures. Hence, following the up-trend of e-mobilisation, the future of transnational activism for animal rights looks good as shown in the development in cyber and real worlds (Calhoun 2004, Lai 2004a).

The web, portal and gateway of PeTA web will continue to support programmes that help people learn about animal rights and how to defend them. Here, PeTA digital materials can be used for schooling, training for NGOs and volunteers. With informative and knowledge-rich cyberspace, this will help more electronic based networking, which should have beneficiary for the formation of social capital (Huysman & Wulf 2004).

More importantly, one of the key functions for digitization of information, knowledge and know-how

of e-mobilisation in various social movements, as well as networking, is to keep the animal rights issue alive even after the campaigns and at the dormant stage of the movement.

Synergy of cyber-activism, animal rights and bioethics advocacy?

The Internet, cyber-space and new (mobile) media have been reshaping the landscape of global and local communications. The most dramatic illustration is that, in the world of new media, the individual can make a difference in broadcasting his/her video footage, as shown in the "MySpace" and "YouTube" platforms.

For the advocacy for animal rights, though it is a minority voice among various struggles for justice; it does have a qualitative differential impact on the human world, thanks to ICT. People learnt from the cyber-activism, made an explicit strategy for alternative daily praxis, with different bioethics principles in their day-to-day lives. All this will have a strong implication for the emergent importance of bioethics in this, as well as the next, modernity.

For exploring the prospects of TANs and bio-ethics advocacy towards a new modernity, four distinct yet inter-related issues can be discerned. Firstly, globalisation has put state-society in a very peculiar position, as both exposed to the challenges of "external" forces: capitals, goods, labour (and jobs) are more mobile than the previous regime of global order.

Sometimes, the globalising forces challenge the livelihood of the people, leading to human rights abuses (WCSDG 2004), juxtaposing against the animal and ecological ones. The challenges in many ways address the sustainability issue of mankind and biodiversity. There is the recognition that global economic change reinforces the existing socio-economic-cultural fault-lines, but it also creates new and different kinds of alignments of non-state actors around core issues and across borders. Their collective impacts are rarely addressed by research, nor responded to by the state policy (cf. Stone 2004). The contribution of TANs of NGOs, such as PeTA and Greenpeace International, should redress this missing link.

Secondly, thanks to ICTs, cyberspace becomes the domain whereby individuals can articulate non-mainstream politics, ranging from human rights to animal rights, ethical and justices on biodiversity at large. Here, non-state actors and non-traditional political themes can enter, and be represented, not just in the cyberspace, but also gain visibility in international politics beyond one's nation state territory (Sassen 2004). Indeed, the diffusion of animal rights information, ranging from the "abuse" to "good practices", from individuals and among NGOs, and social movements can be instrumental in defining the global and local animal-cum-human rights agenda.

Thirdly, the issue of culture and language has to be taken seriously, particularly when human-cum-animal rights is advocated as a global value that many (but not all) cultures share. The problem of cyber-"imperialism" and cultural domination over the universal values of human-cum-animal rights should be noted (Hamm & Smandych 2004, Reifer 2004) here. According to Lai (2004b), English consequently is the de facto standard language of the Internet, and the domination effect of the English language in global communication is threatening the existence of minority languages.

Furthermore, other than language itself, the contents and messages for communication are highly charged for commercial and political purposes, not least being the US style of life: movies, music, comics and other forms of popular culture (cultural imperialism), as well as news and documentaries (the US version of the War Against Terrorism represents such a case). These are a cultural manifestation and celebration of the Western – of global capitalism. In short, as long as the Internet is based on the existing social cultural structure, the Internet could also work to reinforce such cultural imperialism in our complex, globalising world.

Here, it is culturally sensitive that global animal rights and bio-ecological ethics and values be communicable in local languages, at the very least making the case for biodiversity and its universalism down-to-earth. For this, PeTA and Greenpeace International have dedicated multi-lingual websites for the struggle of bio-ecological justices.

Last but not least are the networking logics and dynamics, on the one hand, and the very fluidity of bio-eco-ethnics, on the other. For the latter one, bioethical questions revolving around or against corporate and state agencies in shaping sustainable development, ranging from the nano-scale of genetically modifying processes, to the giga-scale of the climate change and global warming, contesting views on the normative aspects (values and norms) of super-scientific knowledge, are obviously articulated in all forms of new (and old) media encounters. For the former case, the logic of Internet enhanced e-mobilisation is its bottom-up process: communities and interest groups create and facilitate themselves. We need to enable the deliberative skills (informational personality) people may possess, and look into about what actually happens in the space for advocacy. The Net is instrumental in various stages of building up the informational personality in social mobilisation: individual chat rooms and discussion lists enable people to communicate and learn from each other – the stage of discovery of new knowledge, then from knowledge toward the building up of trust among each other, then further enhance their capacity to mobilise others to make the social change – this is in short a progressive capacity building process for social agencies. To recapitulate, the call for biodiversity, its ramification for bio-ecological advocacy, are not just talk and communication in cyberspace, but action in the real world as well: therefore direct actions at local (individuals and community) level are still the basics for social change for a better world.

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Accountability, responsibility and biotechnology – concepts revisited for environmental ethics

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This paper addresses the concepts of accountability and responsibility that are often assumed to mean the same thing. In a previous paper (Maoz, 2005) I have presented the continuous dilemma of tampering with nature that has been accelerated with the development of modern biotechnologies. The genetic manipulation of animals and plants caused heated arguments about the question whether technology can be allowed to intervene in the designs of life itself and the environment. As the years pass, biotechnology continues to matter to more and more people outside the profession.

This phenomenon has brought to an increase in interest in the ethical aspects of technological developments. This increasing interest demands a greater awareness of scientists to ethical considerations regarding the people and the environment affected by their work. This range of social considerations has become relevant also with the development of nanotechnology, a technology directed to unravelling the secrets of matter itself. It emphasizes the need for developing social tools while such technologies are in their early stages. Thus, the ethical aspects of accountability and responsibility are important issues facing scientists today. In this paper these concepts will be discussed, therefore, in the framework of an environmental point of view.

Accountability and responsibility

Accountability and responsibility are often assumed to mean the same thing and used interchangeably. In contrast with accountability, responsibility is defined as an obligation that arises from tasks we assume, and to accept ultimately the consequences arising from the results of our decisions, actions, or inactions. Being responsible involves the capacity to distinguish between right and wrong and to act accordingly. To a significant extent, this is based upon the account we give of our decisions, actions and inactions.

Accountability is entailed by responsibility and is a state of responsiveness. Anyone who is responsible is thereby accountable. Accountability is the readiness or preparedness to be answerable and to give an explanation or justification to relevant others (stakeholders) for one's acts and omissions when appropriately called upon to do so. It is the acceptance of such a readiness and the expectation on the part of appropriate others that one has accepted it. It is then a readiness to have one's actions judged by others.

As we could see from the definitions of accountability and responsibility, it is easy to see their similarities. There are, however, differences between them in the state of anyone who is under one of these definitions that should be emphasized. This is important in order to understand the actions and inactions of the people who are in these frameworks and their level of commitment.

Accountability is not something unusual. We are all familiar with it even if we have never given it a name. Accountability is tied up with common morality. It has also another dimension of norms and values in a different state of individuals namely, in an organisation. This is connected with professional ethics that will be discussed later.

1 The views presented here are solely those of the author and do not necessarily represent the views of either the Ministry of Agriculture or the Israeli government.

The meaning of responsibility, however, may demonstrate a higher level of commitment and may refer to fulfilment of legal obligations to answer for actions, to an authority that may impose a penalty for failure. It suggests a legal responsibility, subject to a review by a higher authority, and if liable, to pay for the consequences. The situation in the case of responsibility means a state of responsiveness: (a) legally, to duties that is mutual and can be shared; (b) by an approach that gives us a gain. By letting the Other (the public) the possibility to respond to changes and new situations. This connection between the concepts of responsibility and the Other is based on the translation of the French term: respons – abilite - let the Other the possibility to respond (Levinas, 1967). That is true also for that term in German (Jonas, 1984). Both states are related to biotechnology and environmental ethics and will be discussed later in that section.

Accountability, responsibility and democracy

Accountability is an integral part of the way that an organisation conducts itself. The obligation to be accountable is enhanced within an environment that supports it for the individual and the collective. Everyone is accountable to themselves, each other and the communities they serve.

Every day it gets less convincing to oppose technology because human life is getting more and more entangled with technology. In a situation like that, binary choices, which do have some meaning in certain cases, are required. Nowadays we are faced with more complex choices and opposing trends are discernible. In contrast with the broad acceptance of many new technologies (like the Internet and computers, mobile phones, keyhole surgery and others), there are other technologies (biotechnologies mainly and nanotechnology) that their acceptance by the public have encountered objection. The struggle between defenders and critics of certain technologies gives way to de-centred discussions between countless users of technology, who all contribute their own experiences, norms, and values.

An important element in the ethical turn in the technology debate concerns a change in the social allocation of moral responsibility. Nowadays there would appear to be little disagreement about the need for organisations to act responsibly toward the wider society and the natural environment in which they operate. Organisations themselves have adopted a wide range of positions regarding organisation social responsibility.

In the previous decades, technology developers and scientists and the opposing parties, seemed to have little or no positive expectations of each other. As a result, they both watched in the direction of the administration to produce collectively binding decisions. The technology watchers lacked the power to directly influence technological development, so their aim was to persuade the government to act as their strong arm by managing technological innovation with the help of laws and financial impulses.

The technology developers and scientists, on the other hand, also oriented themselves primarily toward the government, be it more in the fashion of everything is allowed, except when forbidden by law. Thus, ultimately, the responsibility for technology development was laid in the hands of the administration.

Today, this exclusive orientation toward government seems to make place for a more diffuse conception of responsibility. Citizens, for example, are asked to consume in a more conscious manner and to apply existing technology more wisely. Really new, however, is the appeal to scientists and engineers. No longer depicted as the unthinking slaves of the technological imperative. There is a growing tendency to hold them co-accountable for the social consequences of their innovations. This, of course, on the condition that the organisations where they work give them the chance to give practical content to this responsibility.

With this aim, different kinds of ethical instruments are being developed, e.g., professional codes, ethics committees, and other types of moral deliberation in the course of technology development. The government acts more like the initiator of these kinds of collective deliberation than as a strong arm.

Another factor to refer to is a "democratisation of moral authority". Modern citizens no longer leave it to accepted authorities (officials and politicians mainly) to determine what is right and what is wrong. That is seen as the task of all adult citizens; public debate is conceived as a legitimate source of collectively

binding norms and values. Where the authorities used to call the ordinary citizens to account for their doings, in a democracy the trend is exactly the reverse: the powerful are forced to answer for their doings to the citizens. It is this obligation that is the common denominator in recent proposals for an ethical monitoring of technology development: the technology developers are asked, or mandated, to give an answer for their technological choices to those who have to bear the results of their technology.

Recently, more attention has been given to technology. Technological developments have generated discussion topics which have more to do with the good life (such as the Internet and computers, mobile phones and keyhole surgery) than with the survival of humankind (biotechnologies mainly). The incorporation of technology in our daily life has had a result, that debates on technology cannot simply start from consensual norms and values, but has to take these norms and values as their subject matter. The liberalisation of public discourse in combination with the democratisation of moral authority has led to reallocating the responsibility for technological innovation away from the state and into the hands of technology developers and consumers.

Accountability is something all professionals must accept, indeed welcome, as an essential dimension of professionalism. We should all be able to ask someone or the professional if he is indeed accountable, i.e. answerable. This would mean accepting the norm of transparency namely, disclosing information about his decisions, actions and inactions. The concept of transparency, however, is more comprehensive and includes not only individual professionals but also organisations of different levels (Dubnik and O'Kelly, 2005) that will be also discussed with regard to biotechnology.

In a code of ethics, we can define a scientist's accountability as: (1) responsible research, including all levels of professional activity; (2) the acknowledgment of public accountability; and (3) a commitment to making good faith consultation efforts with affected groups in the hopes of establishing mutually beneficial working relationships.

With these definitions in mind, the following discussion will describe biotechnology's increasing need for accountability to the general public and/or their representatives.

If a scientist feels himself responsible for his findings we should all be able to ask him if he is indeed accountable, i.e. answerable enough for the complex decisions of the present and the future. It has been demonstrated, however, that the feeling of responsibility may be an illusion or delusion without proof of accountability through appropriate merits and qualifications.

The situation of scientists is unsatisfactory in the present and probably more so in the future, when one considers the extent to which, directly or indirectly, the other citizens are involved without wanting to assume the full load of their civic and moral responsibilities. However restricted the scientists' activity may seem, they should be prepared for the eventuality of the results of their work assuming major proportions. But what about the situation of ordinary citizens?

We have always suspected that they are more than simply workers with different careers. They are also considered to be consumers, taxpayers and inhabitants of a planet called earth. We shall then be better prepared to come to this changing world at the threshold of the 21st century. Here we expect the average thinking individual in his special career as well as the scientist to meet in order to be able to satisfy the pressing requirements of the ever dynamic present and future.

Scientists can no longer operate within a certain vacuum generating reports for other scientists. The research they produce has far-reaching effects on society, thus the research products they create must reach a broader audience. This "service" is scientists' professional responsibility. Scientists should better realise the immeasurable benefits to be gained from encouraging public interest in their discipline. Including the public in the work of the scientists helps ensure continued public funding and enlists public cooperation and support.

Scientists can improve their relationship with the public also in the following way. Instead of presenting sterile, politically correct information, scientists need to provide the public with the means to assess, criticise, and redefine the past. Scientists can display scientific information with diverse explanations, rival theoretical interpretations and political content to encourage such critical and creative thinking.

Scientists can achieve this kind of accountability through communication. Scientists can successfully account for their behaviour and forge solid relationships by making efforts to identify and contact the people affected by their work. Scientists must also develop long-term continuous dialogue with these people, not one-way occasional communication.

The transition to a new model of science and society has complicated issues of scientific integrity and responsibility (Guston, 2001). In this paper the following themes that are important to the future of scientific integrity and responsibility were suggested: 1) the role of collaborations between scientists and non-scientists in resolving conflicts; 2) the possibility of new limits to inquiry; 3) a continuing neglect of the social outcomes of research; 4) the presence of interests in the research enterprise:

> Recent history provides ample examples of beneficial effects of scientific and technological developments. But awareness has grown that science and technology have also contributed to the creation of new threats to human existence and quality of life. Starting from the 1970s it became apparent that a preventive policy could be used to eliminate or diminish damage that might be caused by scientific and technological developments. An anticipatory model has been developed and termed: the precautionary principle and it has been applied in the field of ethics, national and international law. Many people, however, fear that this approach of moral nature may stifle innovation or hamper scientific and technological progress. It is clear that a good and successful harmonisation is required among the sectors of stakeholders in order to achieve better balance between the benefits of innovations and their different impacts.

"Democratic forums" that refer to mechanisms for participation and accountability are critical for popular sovereignty. Including democratic forums in science means integrating mechanisms for participation and accountability into science in those places where authoritative decisions affecting interests are at stake.

For the integrity and the responsibility of research, the lever is the ability of the administration to attach strings to its discretionary awarding of research funds. Precisely this dynamics was at work in the establishment of due process protections in research misconduct allegations.

The invitation of democratic forums into science, of course, raises the question of conflicting values and, in the worse case for researchers, potential limits to inquiry. Citizens, even informed ones, may prefer that some research not be performed, or some technology not be developed. The safety issues of new research techniques and technologies, such as those raised by biologists around recombinant DNA research, persist. In such cases the assumption that either there is broad consensus in society for scientific inquiry of any kind, or that the extant mechanisms of funding, priority setting, and conducting research are sufficiently consensual. Rendering this assumption true means that assuring the presence of democratic forums in decision making about research must be prior to discussions about limiting – or for that matter, conducting – research. A similar approach has been expressed earlier by the philosopher Deborah Johnson (1999):

> In light of these views, it becomes clear that a pragmatism approach has to be incorporated in the suggested process. It has to be realised that the tool of democratic forums as a "way of life" entails just a genuine conversation about new meanings and values in which the participants can clearly articulate their own positions as well as to understand those of others. It is critical, therefore, that scientists and decision makers will understand exactly what the public has to say in the specific context regarding their daily lives. It has to be clear, however, that such democratic processes, although essential, are just "tools" in achieving resolutions for those qualified and responsible for it.

Not only should the discussion, and institutionalisation, of democratic forums of participation and accountability be prior to the limits of inquiry, but so too should be the discussion and assurance of the outcomes of scientific research.

"Assurance" is the attempt to increase the certainty that research will lead to socially benign outcomes. "Outcomes" are not the relatively direct outputs of research, including published papers, trained students, and patented inventions, but rather the growing economy, flourishing public health, sustainable

environment, and other societal goals to which research can contribute.

However, to speak, as above, about the increasing identity between responsible science and reliable science is not yet to speak about a fully relevant science. Although we intend science to contribute to social change, sometimes we make provisions neither for anticipating that change nor for assuring that the change favours socially benign or productive uses. The integration of democratic forms of participation and accountability into the scientific subculture can also foster relevant as well as responsible and reliable science. One of the primary difficulties of technology assessment, however, is encountering the technology to be assessed early enough in its development that action constructive for its relevance – rather than blunt opposition – can be taken.

The need for such "constructive technology assessment" (Schot and Rip, 1997) is therefore apparent in conjunction with the earliest stages of the research process at universities as well as in state and private laboratories. Collaboration between scientists and non-scientists on relevant research, with attention to outcomes and the values implicit in research, should occur even from the earliest stages in the laboratory.

Opponents of the democratisation of science raise some potentially troubling objections to this approach. Some may reject the claim that science involves interests. They may also reject the relativist claim, that the ideology or social circumstances of a researcher influences the outcome of his or her specific research. Nevertheless, it is quite another thing to reject claims that those same circumstances influence the choices individuals make in becoming scientists in the first place, selecting a scientific field and specific problems within that field, or deciding what kind of research (e.g., fundamental, applied, theoretical, field, etc.) to conduct.

Traditionally, liberal-democratic areas such as science and research were considered devoid of interests as private spaces. But this is no longer tenable. Not only have we recognised the interests inherent in science and scientists, but we have, as a matter of policy, created incentives to harness their ambition, profit, and lust for technical progress and economic gain. Accepting the presence of motives in technology development means accepting that we should examine critically examples of misconduct by big companies (monopoly, lack of sufficient transparency – improper management of information etc.) and provide effective regulation to control abuses of power and ensure the safety of their products. Equally, we should not uncritically accept the not evident claims and become careless about exaggerated risks to stop funds for technology development.

No one who supports the public sponsorship of research would challenge the role of the public in setting priorities to create incentives for people to become scientists, select scientific fields particularly, and pursue particular kinds of research thought similarly valuable. Yet these decisions create the fundamental outlines of scientific knowledge and technical achievement. The transition from a model of science separate from society to one of science integrated with society requires rethinking notions of scientific integrity and responsibility. Supporting democratic participation and accountability for science does not mean being anti-science and neither is it more threatening than other commonly accepted democratic practices. By recognising the interests present in science, encouraging collaborations between scientists and non-scientists, confronting values that may pose limits to inquiry, and attending to the societal outcomes derived from research, we can simultaneously generate a more responsible, reliable, and relevant science.

Recently, however, society's perception of corporate social responsibility issues has commenced to change in response to globalisation. The term globalisation is perhaps one of the most widely used and least precisely defined concepts in contemporary organisations (Schwartz and Gibb, 1999). There is remarkable growth of the contemporary NGO community: non-governmental organisations (NGOs) currently represent millions of citizens around the globe. The new international media can mobilise those millions overnight if it chooses. This implies that transparency, probity and rule of law are nowadays more important to more people than ever and more and deeper debate over international values; the creation of "global" as opposed to "inter-national" institutions refers to the entrance of new unfamiliar players.

More and more people all over the world consider themselves stakeholders in decisions made. The

shift of power away from nation-states means that the public in general requires more accountability from other powerful actors, such as business, and expects them to respond directly to the demands of public opinion rather than waiting for that opinion to be mediated by government legislation or regulation (Schwartz and Gibb, 1999). New relationships are currently emerging among the traditional social partners.

A major development in this respect has been a significant shift in NGO strategy. Recently however, NGOs have begun paying increased attention to the general subject of business and social responsibility, moving away from the traditional "NGO-government" relationship toward a dynamic "NGO-corporate" relationship (Schwartz and Gibb, 1999).

As the centre of power, this will imply that the norms and practices of "transparency" and disclosing information about their decisions, actions and state of affairs to the public will include the organisations. In welcoming this positive move in the NGOs' relationship, however, its partial commitment to the full scale of stakeholders has to be considered, as compared with those of the defined public "gate keeper" – the regulation.

The role played by public opinion in shaping corporate behaviour is, of course, not new. What is new is the empowerment of the customer in the new economy, as a result of the undergoing revolution in information and communication technologies. Consumers are nowadays informed and use this information to wield power over companies.

Hence, several companies were experiencing crises as a result of perceived irresponsible social behaviour (Schwartz and Gibb, 1999). Responding to enhanced customer information, coupled with consumers' increasing ability to react, companies may be expected to develop even stronger cultures of responsibility, proactively seeking to increasingly honour their moral obligations to society in the 21st century. A most notable evolution in this respect has been the development of a Social Accountability global standard (Fabian, 1998).

The extent to which modern biotechnology will be able to achieve its goals will depend to a large extent on the regulatory regimes that apply to biotechnology and on the way in which they are implemented. The national regulations in turn are strongly influenced by international agreements, particularly protocols on bio-safety (Pretty, 2001).

Accountability, responsibility and biotechnology

The impact of human activity on the environment, both locally and globally, has led to serious ecological and ethical problems. Perhaps a very striking example of human environmental impact is the estimate that the human economy uses directly and indirectly some forty per cent of the terrestrial primary production of plant material produced every year (Vitousek et al., 1986). That means that in only a single doubling of the world's population (or the world's economy) we shall use eighty per cent and shortly thereafter 100 per cent. The latter is ecologically impossible and has serious global and ethical consequences. Agricultural biotechnology should be a contributing technology in answering this challenge.

Our environmental impact can be appropriately quantified in the so-called PAT equation that was introduced (Ehrlich et al., 1977). Environmental impact (I) is a product of three components: the number of people (P) the average person's consumption of resources which is an index of affluence (A) and the Environmental disruptiveness per person of the technologies that provide the goods and services consumed, such as pollution (T).

Hence: *Environmental impact = Population x Affluence x Technology*

Or: $I = PAT$

Another way of appreciating the enormity of our environmental impact is to contemplate the significance of the following issues. Ethical issues associated with agricultural biotechnology are mainly: food safety and environmental (Burkhardt, 2002).

The food safety issue - Most people believe that putting people at risk is ethically wrong, but proponents of biotechnology believe that biotech foods do not put people at risk. Other people believe that the food safety tests performed on biotech foods are incomplete, biased, or the wrong kinds of tests. The conflict is not so much about whether food safety is a good thing, something that ought to be achieved, but whether we can say for sure that biotech foods are safe. If we cannot, then they should not be allowed on the market.

The environmental issue - the ethical conflict here is not so much about whether we should protect the environment, but about how far we should go to protect the environment. Opponents believe that our ethical responsibility to future generations demands that we make sure that biotech products won't cause the environment any harm.

They believe that still not enough is known about the long-term environmental effects of genetically engineered crops, beneficial insects, and microorganisms, so that using these biotech products at this time is wrong. They also argue that biotechnology may threaten biodiversity. Attempts to insert new genes into crop species in order to improve their performance can help creat new strains and increase biodiversity (Wilson, 2002). Proponents are confident that scientific assessments can show genetically engineered products are environmentally safe. They believe that biotechnology will prevent farmers from causing negative impacts to the environment.

The ecological crisis reveals the urgent moral need for an eco-friendly approach. This may enable human beings to lead a life of freedom with responsibility. But the conscience which is the ultimate court of one's moral decision, moral norms, values and attitudes, should deliberately guide the rational beings to lead an eco-friendly approach.

Several strategies can be used to create a better relationship between biotechnology and the public. Outlets such as the World Wide Web may allow real time public involvement and questioning. Scientists can assist create educational programmes for schools and public interest groups (Maoz, 2005). Scientists can also prove their accountability by taking an interdisciplinary approach to their research by discussing the work of a scientist and the research to be conducted in multi-disciplinary workshops.

Industrial modes of production, distribution, and consumption take their toll on the environment, from the simple fact that manufacturing uses energy, that distribution requires transportation, and that most consumption is wasteful. Regardless of the details, it is clear that no matter how beneficial scientific technology remains to this day, its development and implementation, its replacement and maintenance, cost a great deal of money. Efficiency is achieved expensively even under the promise that great savings will result eventually. And some of the damage done to the environment cannot be repaired no matter at what price.

At the same time, what is the price of not developing certain regions of the world? Should the principle of scarcity or that of abundance be employed? What views of humanity should we adopt according to which to measure the value of poverty and hunger? All of these questions must be addressed economically - that is, socially and politically, which, incidentally, is inevitably also philosophically - and not left to spiritual musings or the dictates of self-appointed environmental keepers.

But it is not only technology proper that is on the agenda for those concerned about the environment, but also the ability to pay for ecology-friendly projects that may or may not be more expensive than their ecology-hazardous ones. Without the prosperity of some nation states and their willingness to be heavily taxed, there is no chance of bringing about any change in the current deterioration of the environment. The fact is that crises in environments occur with a greater rapidity than anyone expects, and furthermore, in order to handle these incessant crises, more and not less technology is needed (Agassi, 1985).

Conclusions

Our quest for expanded yields, year-round products, reduced perishes ability and other improvements have resulted in the development of genetically modified organisms. Introduction of those products has created a firestorm of controversy. Scientists (not only) failed to consider the outcomes that society

desired, and the results were widely perceived as harmful to the environment, and the consumers' ability to make choices.

Scientists did not adequately connect the research to outcomes that society wants. What if, at the beginning, research on crop genetics had been linked with popular goals like reducing the use of fertilisers in polluted areas or stabilising maize yields? The research might have followed different paths. The controversy surely would not have been as damaging. The social outcomes of science are rarely considered and are focused mainly on support and the conduct of research. If the social implications of science programmes will not be considered, there is a risk of generating knowledge that would not answer society's problems, instead of solving them. Science must broaden its view.

Early in the beginning of new technology development, new partnerships are required, among academics, government, and business to transfer knowledge about the research and the ways in which each change affects all other groups and our resources. Scientists must also develop and improve long-term continuous dialogue with these people - not jst one-way occasional communication. To think about science in those terms, we will need better ways to assess the social and economic impacts of scientific discoveries. Simply put, science must be supported by the same types of goal setting, analysis and forecasts that guide critical areas of our life.

The increasing impact of man on the environment should have influenced the development of modern technologies with a greater moral responsibility towards the environment. Unfortunately, this is not always the case, so should we avoid technology?

Or, what will be the price if we use it for environmental conservation? In order to achieve success in the analysis and goal setting of these questions we shall need a combined approach based on adequate science education together with a "toolbox" for practical ethics that have been suggested before (Maoz, 2005). Adopting an ethical approach, using consensual norms and values as the subject matter seems to be a preferred direction for reallocating the responsibility for technological innovation into the hands of technology developers and consumers.

Science and its power continue to advance, yet our ability to harness that power for maximum social benefit should not remain stagnant. That mismatch means that the societal costs of the current approach to science should continue to grow in the future. Policies that focus on social outcomes are a key part of the solution.

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Semantics and agro-environmental bioethics: epitomizing conceptual and perceptual domain of human realisation*

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Introduction

The area between sensation and conceptualization is a fuzzy contour of human understanding. Despite abundant philosophical and empirical research, results about how to understand this area that command widespread assent are very scarce. One contributory source to this impasse is the fact that, for mature and intact humans, the sensory, the perceptual, and the conceptual seem merged in consciousness. Perception is phenomenally so "cognitively penetrable" - so infused for humans by discursive understanding - that experimental and theoretical efforts to distinguish between it and conceptualisation, and consequently between it and sensation, often seem constrained only by whatever favoured theory drives the effort. In what follows, we may consider reasons for distinguishing perceptual from conceptual categories and suggest a way of making the distinction between different thoughts and actions.

For example, environmental law is the resultant products of the conditions that arise from the technology humans have developed to satisfy their biological and social needs. Law itself is a social technology. It is a means modern societies use to deal with the challenges generated by the competitive and cooperative activities by which humans make use of the mundane resources. As humans secure their survival by their use of technology, they alter the conditions of their lives. Societies legislate in order to maintain the stability of the social order. Law is the way societies manage technology in ways that keep them from destroying themselves and their environment.

Interestingly the life of any organism depends on the death and life of other organisms. Nature is competitive in two respects: individual creatures' survival depends upon the death of individual members of other species, and the survival of some species depends on the failure of others. Nature is also cooperative. Biologists who follow Darwin in interpreting evolution as a struggle for survival also recognise evidence of what Kropotkin called mutual aid, a natural propensity to cooperate which always emulates the conceptual and perceptual domain of human cogitation and can be defined as biolegacy. Many organisms are social, and the survival of entire species depends on symbiotic relations between members of different species.

As ambiguous as the biological legacy is for animals, the situation is even more conflicted with respect to the biology of human nature. Spencer and the social Darwinists saw human society as a struggle in which only the fittest and most competitive survive. Huxley agreed but drew different conclusions. Like Hobbes, he believed the natural state of human existence to be "the war of each against all". Life among primitive peoples for him is "a continuous free fight", which the social order was established to prevent.

Rousseau, the young Marx, and Freud, on the other hand, regarded destructive competition as a departure from the natural state of humankind, which is cooperation. They saw human behaviour as unnaturally deformed by the conditions of modern society. Human beings are manipulated, tricked, or controlled by those who oppress them, resulting in alienation or repression. Other theorists, behaviourist psychologists and some Marxists and sociologists, regard human behaviour as initially unstructured and plastic, and view human nature as entirely a social product. As the sociobiology debates illustrate,

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the question to how much of human behaviour is attributable to biological structures and how much to historical and environmental influence is one that refuses to go away.

Concept-percept: A virtual bioethical language

Rather than pursue the debate over human nature at first, we would like to discuss about the details of conceptual and perceptual domain of human realisation being the crux of human sociobiology. An approach to the problem of our concern can be made through the Wittgensteinian problematic: Is all seeing, seeing as; and, more generally, does all perceiving require interpretation? On the account suggested by the considerations we shall make, both questions are obscure; the notions of seeing as and interpretation that are engaged by them fail to distinguish between non-conceptual categorisation and conceptualisation. It may be that all visual perception requires categorisation, even though not all categorisation is conceptual. This failure is symptomatic of widespread unclarity about how to understand the differences among sensation, perception, and conceptualisation.

Sometimes the Wittgensteinian problematic is taken as inviting an account of "seeing an aspect", where this is understood as equivalent to an account of seeing something "under an aspect". Recent discussions of "perceptual content", for example, of the perceptual content motivating frogs's leaps at flies, suggest this interpretation. Talk about perceptual content, as of mental content in general, invokes the metaphor of mind as container, standardly, as container of information, and directs one to provide a discursive account of the purported content. To give such an account, however, of what is presumed to be phenomenal "content" how it seems to the frog for example is to engage in conceptualising that content, and from the frog's point of view as it were. But this is to suppose that it is the frog, and not we, who conceptualises this content, a suggestion that can hardly be supposed transparently true, however compatible with some favoured metatheory it may be.

Considerations like this one recommend that casting questions about differences between perception and conception in terms of mental content be avoided, whenever it is possible to do so. For it may be natural to suppose that the frog perceives, but not natural, absent more compelling evidence, to suppose that it conceptualises that which it perceives.

In general, whether or not it turns out that the ability to conceptualise is in fact dependent upon having a public language, one is on safer ground to limit clear examples of conceptualisation to creatures who manifest their conceptualisations in explicit judgments.

Several sets of circumstances conspire to obscure the differences between perceptual and conceptual categories. Here is one such set. Normally we distinguish between sensation and perception in complex and multifunctional organisms according as the response that is evidence for either is a local response by some part of the organism or a general response of the whole organism. Such reflex responses as withdrawing the hand from a hot object are clear examples of the former while fleeing from a predator is normally an example of the latter. A response that is a general response of a whole complex organism, and thus evidence of perception, requires for its explanation some reference to central processing by the organism because a complex organism is presumed to require some way of coordinating its various parts in order to make a whole-organism response.

Thus in humans, the best evidence for categorization is linguistic evidence, what category the subject says an object belongs to.

Perception and conception are conflated, in particular, whenever it is supposed that if there is a general, whole-organism response, then a generalisation that "sends" as it were, appropriate information to each part of the organism involved in the response constitutes a judgment about the character of the stimulus. For, in this way, judgment - construed as generalisation is projected onto pattern recognition and perception.

Categorisation is thus construed as conceptualisation and taken to be a single central function of an organism in which distinguishable stimuli are understood and responded to as if they were identical. In one example of this conflation, Miller and Johnson-Laird (1976) studied perception and language. They discounted any developmental distinction between a response and an assertion on grounds that there

is no evidence that such a development occurs. Consequently, they built judgment into perception itself, dispensing with any need to account for assertion as a distinct cognitive practice.

But what would count as evidence of such a developmental difference in the course of language acquisition? Certainly, anything that is a response, linguistic or non-linguistic, is categorical in as much as it is a whole-organism response to some generalised perception, one, that is, which involves pattern recognition by the organism as a whole, and, thus, also involves central processing. Nevertheless, there may be a difference between perceptual categorisation and conceptual categorisation that is discounted if all evidence of categorisation is taken as evidence of conceptualisation.

Another example of the tendency to conflate perceptual and conceptual categorisation is suggested by Medin and Barsalou's comparative study: "Categorization Processes and Categorical Perception" (1987). They begin this review of experimental data on categorisation presuming a distinction between "sensory perception" (SP) categories and "general knowledge" (GK) categories and identifying general knowledge categories with (linguistic) semantic categories; thus, they begin by assuming that perceptual and conceptual categorisation are different phenomena. They propose to compare the two types because most empirical research has been on one or the other, but not both. The conclusion of their comparison, however, seems to bring them close to conflating perceptual and conceptual categories. The conclusion of their comparison is that there are "deep similarities" between SP and GK categories, and they urge further study at this intersection which help us to analyse the idea synthesis being the basics of understanding the ethical evolution.

How might a distinction between perceptual and conceptual categories be drawn, supposing that the above considerations suggest that such a distinction should be made? How, that is, might we conceive of the difference between such types of categories so as to capture the chain of intuitions linking the considerations raised above? And, further, can we conceive of such a difference in a way that might provide some conceptual advance about the several issues currently we are facing with a moral dilemma?

We propose that the focus for such a distinction may be found in adopting a principle introduced by Evans, what he called the "Generality Constraint" as a characterisation of conceptual categorisation and as distinguishing it from perceptual categorisation. Although Evans introduced his principle in a context different from this one and with quite different theoretical goals from those that we are presently concerned with bioethics in relation to agro-environment based empirical analysis.

Evans was also keenly aware of the importance, and the difficulty, of distinguishing between perception and conception. Indeed, Gillett has argued (1987) for the stronger conclusion that there is a conceptual relation between Evans's constraint and the idea of a conscious thinking subject. The constraint is introduced in Evans's work during the course of discussing Russell's theory of singular terms and was intended to contribute to an account of what is required for a person to be able to make a predicative judgment about a particular individual and/or incident.

Hence, the sentence schemata used in its statement are schemata for particular statements, and, so, use individual constants (i.e., Δ). The present discussion is that the same constraint, with some minor changes that include changing its individual constants to variables (e.g., Δ to Δn) in the schemata, can be used also to characterise the ability conceptualizers have to make predicative judgments using general terms, concepts, or conceptual categories.

Human-environment: Interactive model for bioethics study

Now we will focus on the relation between humans and their environment as compared with that of other creatures. Like everything else in the biosphere, humans exist by effecting changes in their environment. Whatever any creature does to keep itself alive affects other flora and fauna. Human interaction with nature differs from that of other creatures by their use of tools and technology. Unlike other species, humans do not do very well without tools and technologies, either in exploiting their environment or in defending themselves against other species. They need technologies in order to survive.

Technological development is cumulative. History began when technological change so altered

the conditions of human life that the world to which each generation of humans had to adapt was significantly different from the one its ancestors inherited and different from the one it bequeathed to its successors.

Humans have histories because they have developing technologies. As change in the natural environment drives biological evolution, technological change drives cultural evolution. Since human-environmental interactions are mediated by technology, no environmentalist philosophy can be in total opposition to technology. Environmental policy questions are not about whether humans should intervene, but how. Humans have a dual relation to nature: they are part of nature and they stand outside of it.

To the extent that they are outside nature, everything they do is a form of intervention. Their capacity to disturb the rest of nature is linked to their propensity to be concerned about it and to intervene. Environmental protection advocates employ technology, not only in their everyday lives, but also by promoting species management, environmental conservation, biological research, and law enforcement. Environmentalism assumes both the possibility and the necessity of intervention.

Human activity is not the only source of massive species destruction, of course. At least five earlier mass global extinctions during the last half-billion years have been noted by paleobiologists, the most recent of these involving the extinction of the dinosaurs 65 million years ago. Humans are the perpetrators only of the last - or most recent - spasm of massive species destruction. Human concern about environmental threats derives not from the fact that humans can be blamed for rapid and extensive species destruction but from a recognition that humans are the only creatures that are able to do anything about it. Technological problems spawn technological solutions. Humans engage in productive and destructive acts and they also have the capacity to deliberate and conscientiously intervene in each others' lives and the lives of other creatures. Technology threatens nature and it manages that threat.

Human behaviour is governed by two kinds of laws. Biological laws provide the basis for explanations of what happens in the lives of natural creatures. Environmental laws are prescriptive legal rules that human beings enact to direct and restrain what their conspecifics do in and to nature. Laws of the second kind, which apply only to humans, protect the parts of the world that are governed only by laws of the first kind, by limiting what happens as a result of human use of tools and technology.

Positive law - the rules human societies adopt to direct voluntary action-can be conceptualized in two ways, corresponding to two ways of viewing the management of human behaviour. Rules are outcome-directed, or they are process-oriented. Laws are designed either to achieve or prevent certain types of outcomes or to promote and maintain social practices. Rules can serve to advance independently specifiable goals, and they can secure the continued operation of a system of activities.

Law that fits the outcome-directed model is exemplified by substantive criminal law. Its prohibitions presuppose the existence of independently identifiable wrongs - conduct that is bad in itself or bad because of its foreseeable consequences. Whether grounded in natural law or based on a social value such as utility, criminal law is directed toward acts whose rightness or wrongness does not depend on the laws that prohibit them.

Arguably, much of the law that limits the use of technology is outcome-directed well. Technology regulation concerns the way people do things, but its focus is often on resulting states of affairs. Legislation is supposed to prevent people from pursuing goals using methods and materials in ways that produce unacceptable outcomes. Rules governing the use of hazardous commodities are defended as needed to protect the innocent from the intended and unintended consequences of their use. Technology law addresses the negative externalities of productive activity.

Process rules have a different thrust from outcome-directed rules. Their purpose is to maintain procedures and processes whose continuance is important to the functioning of a collective. Laws of this kind regulate human activity not for sake of achieving or preventing specific outcomes but to allow activities to continue without breakdown. Their job is to moderate, not to prohibit. Process laws balance opposing interests. Their efficacy depends on the extent to which they prevent the destruction of practices that can yield any of a number of possible outcomes, or no outcome at all.

The process model finds its clearest application in politics and in the legal process itself. Election laws set the rules of political succession by specifying how a political system can continue without serious disruption. Rules of criminal procedure and civil procedure detail the ways disputes are to be resolved while maintaining peace and stability. The function of these rules is not to prevent harm or achieve any specific result but to keep the activity going.

Commercial transactions are also governed by process laws. Contracts facilitate human interaction by setting boundaries around certain classes of activities. Rules of contract encourage productive exchange by reducing risks. By increasing the likelihood that transactions will be mutually beneficial, these rules help to keep the economic system running smoothly. Anti-trust laws maintain competition by regulating aspects of commercial activity that are destructive of competition. They protect human agents by restraining acts that would lead to the cessation of their productive activity. The benefit to outsiders of anti-trust law, thus conceived, is secondary to the preservation of process.

The quintessential practice whose rules are process laws is a game. Games are self-contained activities with no external payoff and no predestined winners or losers. Rules limit what participants can do to each other, but only so far as they are all players in the game. The importance of what happens in a game depends entirely on its role with respect to other occurrences within the game. Nothing outside the game is supposed to affect the outcome.

Besides constituting a set of activities as a game, rules ensure that the game continues to run its course. The rules are not designed to prevent anyone from suffering the harm of losing. Enforcement is important, not to ensure or prevent any particular outcome, but to allow the activities of game-players to continue without disturbance. Cheating renders a game unstable. Participants are compelled to follow the rules in order that the game go on. Games are governed by a number of different types of rules. Rules of play and the rules of scoring define the course of the game and indicate how the outcome is determined. Rules specify the actions participants must perform, and in some instances disallow certain actions and bodily movements. Rules of participation determine who shall be allowed to play. Rules also specify the arena. Other rules set the conditions under which the game is to be played. Still others work to neutralize certain natural and unnatural advantages.

The most important kind of rules, for the purposes of this essay, are technology rules. These are rules that are intended to eliminate or prevent the creation of advantages resulting from superior tools and technologies. In a game, this is done by specifying what equipment is and is not permissible. Balls and sticks have to be of regulation size. A baseball pitcher is prohibited from moistening the ball. Track and field competitors are not allowed to inject themselves with performance-enhancing chemicals. Boxers can use only gloves of a certain size and weight. By specifying and limiting technology, rules limit the extent to which any class of participants can dominate the game. They help to ensure that participation in this cooperative and competitive activity will not cease altogether.

The thesis being advanced here is that the most effective way to conceptualize rules that limit technology in nature is to view them as process rules whose function is to protect the environment in the ways that technology rules of games limit action in games. Environmental law is a form of technology regulation whose task it is to maintain the conditions that keep technological societies going.

Nature itself can be seen as analogous to a game. Like a game, nature is self-contained. Its effects are found only within nature, and need not be assessed in terms of any outside standard. Nature's continued survival, from a naturalist perspective, is all there is. There are no privileged players, no preordained winners or losers, no one who deserves to win or lose. It is the system that must survive, not any particular components. As nature is both competitive and cooperative, so are games. A game is a cooperative enterprise wherein participants compete against one another according to the rules.

Conceiving nature according to a game model allows us to view technology's threat to nature as comparable to the potentially disruptive effects of technological innovation on competition within a game. Collective acceptance of constraints makes the game possible. Use of extraordinary means for pursuing individual ends can lead to its destruction of the entire enterprise. When a player or team introduces a device that enables it to vanquish all opponents and makes them unable or unwilling to continue to participate, the game is ruined.

The idea that rules function to keep the game going explains why there are rules of ritualized conduct, and even rules of war. Traditionally, war has been waged according to rules. To the extent that both sides adhere to rules of military engagement, war is a cooperative venture. A state of war requires mutual recognition that both sides are engaged in armed conflict. Rules keep the brutality from escalating to the point where all participants are in danger of being wiped out.

Rules of war include technology rules. Such rules limit the kinds of destruction that one side may inflict on the other. The adoption of a rule by the Geneva Convention after the First World War not to use poison gas represented a collective decision of nations not to allow such injuries to continue as part of the costs of war. The kind of war everyone wants to avoid is the war that will end all wars, because there will be nobody left to fight on either side. War technology rules preserve the World for more wars.

Games are a paradigm of what Rawls calls pure procedural justice. In a game there is no independent criterion for the rightness of the result. It is not merely that the rules must be followed for the game to be fair: the rules are all there is. Pure procedural justice means that the outcome is fair whatever it is, as long as the activity is carried out according to mutually agreed-upon rules. That situation contrasts with the imperfect procedural justice of a criminal trial, wherein a person is supposed to be convicted if and only if he has committed the offence with which he is charged.

There procedural fairness makes a correct result likely, but it does not guarantee it. Activities such as games, wherein competition occurs against a background of cooperation, depend on notions of fairness. Fairness is a matter of procedure, not outcome. In nature, love, and war, as in games, all is not fair. When the rules of a game dictate that the contest shall be won by skill, strength, or fortune, succeeding by other means is unfair. An unfair procedure is one in which a participant has an unfair disadvantage. An unfair practice gives its user an advantage that is deemed unfair because it falls outside recognised rules of competition.

Fairness does not require that everyone have an equal chance of winning or achieving dominance, however. Fairness implies a kind of equality whereby everyone is bound by the same rules, but it does not require the sides to be evenly matched, or that the outcome was ever in doubt. A lop-sided contest can still be judged fair as long as none of the differences between contestants is seen as arbitrary.

Not all games are fair, furthermore. A game can be unfair even when nobody cheats, if the rules favour one side or the other. A game is fair only when the rules minimise the effects of arbitrary conditions. A gambling game is unfair if the bets are unfair. (A fair bet is one in which no participant has a rational expectation of gain.) When the rules of a gambling casino give an enormous advantage to the house, fairness is violated. The same would be true of an insurance plan in which one's chances of "winning" depend significantly on whether one is the seller or the purchaser of the insurance. The rules of that kind of game would ensure unfairness.

One way that a contest can be unfair is for the outcome to be determined by one side's having access to technology not available to the other. Among the rules that maintain competition in sports, we have noted, are technology rules. Disparate technologies upset equality of chances of winning in ways that may be considered arbitrary. Technological advantage can turn a fair contest into an unfair one - or at least provoke complaints to that effect - by shifting the balance between competitors.

In a race of gravity-powered go-carts known as the Soapbox Derby, for example, fairness was violated when one competitor surreptitiously installed an electric motor into his cart. If the rules are designed to maintain lively competition, that purpose is frustrated when devices are employed that allow one competitor to dominate the outcome. Technology regulation serves to maintain an appropriate degree of fairness.

Sports rules regulate technology by placing limits on the equipment participants may use. When a pole vaulter first introduced a fiberglass pole or the America's Cup was won by a multi-hulled boat, or when a weightlifter or shot putter takes steroids and runners engage in "blood-doping" (where a contestant receives a transfusion of artificially oxygenated blood), rule-makers have reason to be concerned. Rules specify types of sticks and poles, types of shoes, and types of substances competitors may inject or ingest. Unless the contest is itself a competition between technologies - automobile racing is an

example -technology upsets the balance that fairness requires because it renders the existing rules inadequate to preserve fair competition.

There are no principles behind these technology rules, other than they should contribute to what will be acknowledged as a proper balance. Rule-makers' concern is not to eliminate all differences, but only those that allow some participants to dominate. The criteria are pragmatic: whatever is in the interest of the game. What matters is that the game be fair and to be seen as fair. Technology rules are adopted in order to sustain that end. If participation is voluntary and motivated by a desire to win, rational players will demand that the game be fair as a condition for entering.

Among the kinds of activities wherein fairness is determined by technology rules are those human interactions with nature that comprise the predatory sports. Hunting and fishing - at least to the extent that they are governed by rules concerning what is and is not permissible - have the express logic of games. Hunting laws limit the season, the quarry and the weapons. So far as they are conceived as sport and not (merely) as productive activity, they are expected to reflect standards of fairness. Environmentalists typically recognise at least minimal technology as fair.

Few environmentalists are upset by fly-fishing. Sport fishing by machine gun, on the other hand, would probably be universally condemned. Tracking deer with electronic motion-detectors, using headphones that amplify low-decibel sounds and deaden loud noises and using a rifle equipped with a high-powered telescopic sight, all contribute to making hunting a very different activity from hunting by longbow. The use of maximal technology strikes most sports enthusiasts as unfair. They say that it takes all the fun out of it.

Given that humans make the rules, it should not be surprising that they favour the human contestant. Rules tend to focus on fairness between human competitors rather than between humans and other creatures. The rules are designed to give the quarry a chance, but not an even chance. Biased standards are standards nonetheless. In bullfighting - one of the most ritualised of predatory sports - the rules are set to ensure that the bull loses most of the time, but not all of the time. The derision that greets the bullfighter who violates standards of fairness reflects the demand for fairness that sportsmen and women insist on, even in the most brutal sports. Sportsmanship is expected to prevail.

As technology undermines fairness in the predatory sports, so it does with respect to environmental interaction in general. Environmental regulations set limits as to how much and what kinds of assault on other organisms shall be permitted, given humans' need to consume other organisms in order to survive.

Human values, not biological necessity, are what make it acceptable to satisfy human desires by sacrificing some flora and fauna and not others, and unacceptable to destroy as many as the most aggressive may choose. In the absence of an independent outside standard that determines what kinds of plunder shall be allowed, human agents' concern must be limited to choosing rules that the human community believes achieves fairness, all things considered. The analogy with hunting and fishing reminds us that political battles over environmental issues are debates concerning what is fair - not only with respect to contending human parties, but to other creatures as well.

Fairness being a human value, it has no place in nature except as humans are themselves intervening participants. As far as interactions involving only nonhuman creatures are concerned, nothing in nature is either fair or unfair. That some animals prey on others by taking advantage of their weakness does not raise the question of fairness. Humans, as voluntary and responsible agents, regulate their interactions with nature because they value the continued existence of the natural world and the species it contains. They make legislative decisions requiring substantive determinations reflecting human values, and they are accountable for following or flouting environmental rules.

Fairness in interaction with other organisms is in some respects like fairness in a political order, but it reaches beyond. Like fairness in politics, environmental fairness requires procedures for determining whose values will be decisive. Unlike political fairness, it requires being fair to creatures that are neither members of the electorate, nor represented by members. Regulation by humans need not be construed as only for humans.

Some people may resist the game analogy for environmental regulation, stressing that much of environmental law is specifically designed to prevent specific kinds of harm. The process model is, after all, not the only way that environmental protection can be conceived. Critics of the game analogy may point to environmental protection laws that are designed to prevent certain kinds of harm such as pollution and the destruction of species. Laws regulating automobile engines and fuel, like laws regulating ownership of weapons, are surely intended to prevent harm to those who breathe the air. Conservation laws prevent the destruction of (some) items of natural beauty. Endangered species laws are supposed to preserve the present configuration of natural kinds of creatures on earth. Pesticides are prohibited because of their harmful effects on creatures other than the ones they have been devised to control. Recycling laws retard the exhaustion of natural resources and reduce the quantity of solid waste.

Acknowledging that many environmental laws target specific ends does not render the game analogy inappropriate for nature, however. The rules of games include not only internal, formal rules but also rules that limit the time, place and manner in which an activity can be pursued. There are restrictions as to where and when a game can be played, and there are rules that determine who is an eligible participant. Like the predatory sports, games are confined within socially recognised limits. Bald eagles and Bengal tigers are ineligible players.

Regulations entail restrictions, but that does not make them prohibitions. There are indeed conditions under which playing a game has independently identifiable bad effects. Sports activities are often limited for that reason. Duelling is illegal and boxing is regulated because of these sports' adverse consequences. Bad consequences are also the reason why the trade in rhinoceros horns and elephant tusks and alligator hides is prohibited. Societies have rules that restrict human economic activities in order to keep them from depleting certain of the earth's resources. The rationale is not that extracting wealth from nature is bad, but that it can have harmful consequences when pursued in certain ways. Like the rules of games, rules that direct human productive activity enable as well as restrict.

Regulations in general are not prohibitions, except in a derivative sense. By requiring that activities be done safely and in moderation, regulatory rules allow cooperative and competitive enterprises to flourish. Laws that specify limits concerning wages, hours, and the work environment should be considered not as prohibitory legislation but as rules that set conditions conducive to the safe conduct of these activities. By the same token, rules that limit human productive and non-productive activity for the sake of environmental conservation, like laws of business practice, are laws that can be thought of not as preventing evils but as contributing to the preservation and continuation of practice.

Conceiving environmental laws as process rules does not imply that laws governing human conduct with respect to other creatures must be seen in all cases as regulation of legitimate activities. Laws regarding the treatment of dogs and cats are clearly designed to prevent abuses and are better seen as proscriptions of plain wrongdoing. Such measures are more like criminal law than they are like rules of a game. Animal protection laws that presuppose independent notions of right and wrong are not environmental laws at all, because they are directed at individuals rather than species. Laws that protect individual creatures are aimed not at regulating technology but at achieving certain specific results.

Environmentalists' efforts to save tropical rain forests and endangered species lead them to seek laws they believe will to achieve those ends. The burden of this essay has been to suggest that the ultimate concern of preservationists, like that of sports promoters, is to maintain a lively competition. Technology skews the ecological balance in the same way that it upsets fairness in sport. Applications of technology to improve performance beyond what competitors lacking that technology can achieve not only reduces competition but can ultimately destroy the activity altogether. Wiping out species through the use of powerful technologies ends the game for present and future participants.

Disputes between those who view certain kinds of individual life as inviolable and those who view species as sacred objects whose extinction is tragedy, are irresolvable as long as they are conceived as struggles over what evils law should prevent. Political debates over the value of biodiversity and the rights of humans and other animals are less intractable when interpreted as disputes over how to keep the game of life going and what kind of game we want to play. The argument is not over ultimate values, but over competing forms of life.

Technology is where games and environmental concerns come together. Environmental regulations set forth what may and not be done with technology. By limiting the technological advantages humans enjoy over other creatures, environmental rules, like the technology rules of sport, serve to maintain a balance by ensuring that competition occurs at a certain level. Regulations are necessary to prevent some people from spoiling the game for others. That is all that can be expected of them.

Environmental and ecological studies often reflect a desire to help people disabuse themselves of the idea that humans are not part of nature. As coinhabitants of the natural world, humans need not and cannot accept the idea that nature is only a set of resources to be managed and exploited. Yet humans are outside of nature in that they are the only interveners. Recognition of the idea that humans do unnatural things is necessary for an environmental policy to be possible at all. The game analogy points us in the direction of remembering that humans are part of nature, that they belong to nature. It should also remind us that ultimately there is no difference between humans managing nature and humans managing their own affairs.

Philosophers have long been interested in meaning, but we believe they have often been hampered by the limits of their investigatory techniques. We think that modelling work on language and communication across a range of other disciplines, on the other hand, has sometimes been hampered by limited conceptual models for meaning.

Philosophers have typically relied on armchair reflection and linguistic intuition alone in developing theories of meaning, a source amplified only recently to include wider data from linguistics (Larson and Segal, 1995). One of our aims here is to offer computational modelling as an important addition to the toolkit for serious philosophy of language.

The limitations of modelling work across various disciplines due to limited conceptual models for meaning are somewhat more complicated. We offer a very rough sketch of alternative philosophical positions regarding meaning, both as a way of characterising trends in contemporary research and in order to make clear the approach that motivates our work here.

What is it for a sound or a gesture to have a meaning?

Idea synthesis: model approaches

The classical approach has been to take meaning to be a relation. A sound or gesture is meaningful because it stands in a particular relation to something, and the thing to which it stands in the proper relation is taken to be its meaning. The question for any relational theory of meaning, then, is precisely what the crucial relation is and what it is a relation to.

One time-worn philosophical response is in terms of "reference", taken as a relation to things in the world. Words have meanings because they have referents, and the meaning of a word is the thing to which it refers. In various forms such a theory of meaning can be found in Augustine (c. 400 AD), in Mill (1884), and in Russell (1921, 1940).

A second philosophical response is to consider meaning as a relation between a sound or gesture and the images, ideas, or internal representations it is used to express. On such a view the meaning of the word is that thing in the head it is used to convey. Communication becomes an attempt to transfer the contents of my head into yours, or to make the contents of your head match mine. An ideational theory of this sort can be found in Aristotle (c. 330 BC), Hobbes (1651), and Locke (1689), with a more sophisticated contemporary echo in Fodor (1975).

A third approach is to consider meaning as a relation neither to things in the world nor to the contents of heads but to some third form of object, removed from the world and yet non- psychological. Here a primary representative is Frege (1879).

It is our impression that relational theories of meaning are alive and well across the various disciplines involved in contemporary modelling regarding communication and language. The relational theory relied on is generally either referential or ideational; we take it as a sure sign that the theory in play is

ideational when the measure of "identity of meaning" or "successful communication" is correspondence between individuals' representation maps or signal matrices.

A referential theory, in which the meaning of a term is taken to be the object or situation it applies to, is more or less explicit in Batali (1995), Oliphant and Batali (1997), and MacLennan and Burghardt (1994). An ideational theory, in which communication involves a match of internal representations, is a clear theme in Levin (1995) and Parisi (1997); if activation levels of hidden nodes are taken as internal representations, Hutchins and Hazlehurst (1995) belong here as well. In modelling studies for language outside the immediate range of this paper we also find an ideational theory explicit in Livingstone and Fyfe (1999), Nowak, Krakauer and Dress (1999), Nowak, Plotkin, and Krakauer (1999), Nowak and Krakauer (1999), Livingstone (2000), and Nowak, Plotkin, and Jansen (2000).

Relational theories are not the only games in town, however. Much current philosophical work follows the intuition that variations on a Tarskian theory of truth can do much of the work traditionally expected of a theory of meaning (Quine, 1960; Davidson, 1967; Larson and Segal, 1995). Of prime importance since the later Wittgenstein (1953) are also a class of theories which emphasize not meaning as something a word somehow has but communication as something that members of a community do. Wittgenstein is a notoriously hard man to interpret, but one clear theme is an insistence that meaning is to be understood not by looking for "meanings" either in the world or in the head but by understanding the role of words and gestures in the action of agents within a community.

The emphasis on language as something used, and on significance as a property of use, continues in Austin (1962), Searle (1969), and Grice (1957, 1989). In Austin and Searle performative utterances such as "I promise" take centre stage, with the view that at least large aspects of meaning are to be understood by understanding an agent's actions with words. In Grice the key to meaning is the complicated pattern of intent and perceived intent on the part of speaker and listener.

We share with this last philosophical approach the conviction that a grasp of meaning will come not by looking for the right relation to the right kind of object but by attention to the coordinated interaction of agents in a community. In practical terms, the measure of communication will be functional coordination alone, rather than an attempt to find matches between internal representations or referential matrices.

The understanding of meaning that we seek may thus come with an understanding of the development of patterns of functional communication within a community, but without our ever being able to identify a particular relation as the "meaning" relation or a particular object concrete, ideational, or abstract as the "meaning" of a particular term. In applying tools of formal modelling within such an approach to meaning our most immediate philosophical precursors are Lewis (1969) and Skyrms (1996).

Although the modelling literature may be dominated by relational views of meaning, this more dynamical approach also has its representatives: we note with satisfaction some comments in that direction in Hutchins and Hazelhurst (1995) and fairly explicit statements in Steels (1996, 1998).

Here an analogy may be helpful. We think that current misconceptions regarding meaning and the road to a more adequate understanding may parallel earlier misconceptions regarding another topic, biological life, and the road to a more adequate understanding there.

There was a time when life was thought of as some kind of component, quality, or even fluid that live bodies had and that dead bodies lacked. This is the picture that appears in the Biblical tradition of a "breath of life", for example. As recently as Mary Shelley's Frankenstein (1831), life is portrayed as something that a live individual has and a dead individual lacks; in order to build a living being from dead parts one must somehow add the missing spark of life.

Conclusion: How far true?

We now have a wonderful biological grasp of the phenomena of life, elegantly summarised for example in Dawkins'"replicators" (Dawkins, 1976). But in our contemporary understanding life is not at all the kind of thing that Mary Shelley would have looked for. We understand life not as a magic component within individuals at a particular time but as a functional feature that characterises a historical community of

organisms evolving over time. Our understanding of life is also an understanding of something that may be continuous and a matter of degree: the question of precisely when in a history of evolving replicators the first creature counts as "alive" is quite likely the wrong question.

Our conviction here, and the underlying philosophical motivation for the model we would like to have at our disposal through the global bahaviourome programme, is that the same may be true of meaning. What we seek is a better understanding of the phenomena of meaning, which may come without any particular relation definable as the "meaning relation" and even without identifiable "meanings". The proper way to understand meaning may be on the analogy of our current understanding of life; not as an all-or-nothing relation tying word to thing or idea, but as a complex continuum of properties characteristic of coordinated behaviour within a community - a community of communicators - with respect to their environment and agriculture developing over time.

Suggested Readings

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Elise Huffer and Tui Rakuita (Fiji) - Land and people as the measure: A Pacific ethic of place and prudence.



Discussion

Discussion and discourse at the conferences account for a significant part of the meetings. They are often wide-ranging and equally thought-provoking. Excerpts from some of the discussions are, thus, provided in the following pages. They are identified by the titles of the presentations after when they occurred.

Aruna Sivakami (India): I have two questions for you. When you spoke about the Pacific Islands, I would like to ask about the term used by a former prime minister of Fiji, who originated from Andra Pradesh in India, who called mahogany "Green gold" What is the ethics of selling products of the land, as corruption is seen quite often? My second question is whether there is conflict between the original people and later colonisers?

Elise Huffer (Fiji): Mr. George Stat was involved with selling mahogany. The company had some American involvement and there were some unethical components. A lot of the leadership is involved in commercial practices. There is some tension between the different ethnic groups in Fiji and some differences in values.

Irene Taafaki (Solomon Islands): Without land there is no sense of coexistence. In 1998 there was a large roundtable on culture and cultural rights and the outcome of this was that there would be there would be a clearing house of how ethics would be collected. Cultural knowledge is an important task for UNESCO to be involved in.

John Buckeridge (Australia): Applying ethics in a professional context: What can we hope to solve?

Darryl Macer (UNESCO): Thank you for sharing your impressions from the Special Consultation session of the UNESCO IBC held in April 2004 on the draft Declaration on Universal Bioethical Norms. I was at the same UNESCO meeting, representing the United Nations University (UNU). UNU like IUBS also considered that environmental ethics should be a greater part of the declaration. Maybe half of the national bioethics committees present shared the view that environmental ethics should be included substantially, and half did not. Some thought that a second bioethics declaration, focused on environmental ethics, could be developed through COMEST. However, a consensus was not possible to have UNESCO develop a declaration on environmental ethics.

John Buckeridge (Australia): The decisions had enormous consequences, because COMEST also could have done something then.

Daphne Furtado (India): I come from a college where we have run medical ethics as a course for the past twenty years. We don't have an evaluation system, so what happens is, when students end that course, the interns apply what they studied. But as such there is no evaluation system, so is it important to have an evaluation system?

John Buckeridge (Australia): All our courses are evaluated, and it's done, of course, anonymously, and we get feedback. You have to have an evaluation system. It obviously makes the students feel that their voice is being heard, but it also makes me as a professor respond in a different way, because I never do the same thing the next year around. I am always improving. Some of my students may not say so, but I think I am.

A. D. Valsala (India): Awaiting liberation of animals from experimental clutches?

Irina Pollard (Australia): Thank you for your most important talk, I think that's really a case that we have to think about very seriously about, especially when you look at farm animals and how they are suffering. For the environment we should reduce our population. We are taking out all the resources. We are filling this planet. Our population increase is not sustainable. We must learn to control our own excesses in reproduction if we are going to allow animals to use and enjoy their own habitat.

A. Valsala (India): It is time for us to think that exploitation of natural resources by humankind is unethical. We need to remember that we are a culture that is developing chickens in the factory farms. Now or in the near future, I think scientists will combine genes from chickens with genes of the centipedes, in order to get more legs. We do not bother about how this organism will be transformed in transgenic science. We need to give animals their dignity and rights also.

D.S. Sheriff (India): In India it is not so easy to use animals for experiments, as you said, because there are animal rights groups. I know one of my doctoral students had to wait five years because he was working on monkey brains, so he could not complete his studies because animal rights groups are very severe about how you are using animals. There is a protocol that if you want to use any animals you have to justify how many animals you want to work on, what is the purpose? what kind of injection are you going to give? what type of killing are you going to do? and what is the mortality rate? Only if it is considered justified are you allowed to do the research. Another thing is, as the previous speaker has said, grassroots. When you look at the grassroots reality, during one of the celebrations you have seen, truck loads of buffalos are being transported carelessly for slaughtering. If you could look at them that is a greater tragedy than what they are doing to our family members.

A. Valsala (India): In my opinion you have to have a licence for doing research on animals so that human exploitation can be reduced.

Masato Motoki (Japan): Observation on environmental ethics, animal rights and awareness

Morgan Pollard (Australia): I think that your observations on animal rights reflect the common truth about individuals having concern about the environment and living in an environment where that concern has no ability to really be expressed. The local scale and the global scale are really being out-competed by the middle scale, which in real terms means corporations, governments and institutions which are run by a vast majority of people and have in fact institutionalized barriers for ordinary people to follow what they truly believe, both as desires and in gaining ability.

Masato Motoki (Japan): I would like to say, in Japan especially people who live in the city have been staying far away from reality. I mean, many people will not actually see it happening in front of their eyes. They are not, maybe, experiencing. I think your idea is very good.

Aruna Sivakami (India): I'm just seeking clarification, have you found out whether animals are ill-treated or tortured and abused in Japan?

Masato Motoki (Japan): I think this case is happening. Animal rights movements are actually in Japan, that's why I contacted them. Yes, actual abuses are happening, but they do not appear really common.

Nat Tuivavalagi (Pacific Islands): I am very interested in your findings and I tend to agree absolutely with your conclusions. I am very concerned about the huge amounts of workshops and the teaching on the environment in the Pacific and maybe elsewhere. And what you are pointing out is the importance of actual field experience. I think field work is also important for people who are trying to introduce courses in high schools and universities. But I also want to remind us about the importance of religion. If a society already has a religious tradition, we should try to link the environment with the religious tradition because it is one way by just talking that we can influence attitude and behaviour. For example, from the experience of the Christian tradition where they already believe in "love thy neighbour". People can be easily attracted to follow religious examples.

Paungphen Choonhaparn (Thailand): I have not been to Japan yet, but I have been to Sweden and I know how important the environment is. You live in Sweden and you live in the garden of Eden. I think because when you look out of your house you can see the lakes and the ducks running around and I want my country to be like that. But in Thailand, people destroy our environment a lot. Now the government understands that and they ask all the factories to donate money, and income to grow new forests and donate to any school that would like to have a programme that would like to preserve the environment.

Mary Vimalakumari Kalaiarasi (India): Animal Rights and Ethics

Aruna Sivakami (India): You are exaggerating the idea of animal rights and animal protection. We require

animals and you cannot prevent people from eating animals, whether they are birds or cows. You cannot educate people in that way, and you cannot insist on your morals and say what they should and should not eat. You can say that they should limit the use of animals. You must take reality into consideration. Animals, whether they are birds or insects, have limited life and face dangers in nature. There is nobody in nature to protect them. Their lives sometimes finish accidentally. Sometimes, they live their lives, maybe for three days, three months, three years or for fifteen years, and they complete their lives. I think we cannot prevent the use of animals in experiments. We record our experiments on animals, without which human health cannot be protected, so let us not stretch it too far.

Mary Kalaiarasi (India): I don't think I am exaggerating, I am talking about the reality. Whether we can take action and take care of animals depends on the circumstances. I am not saying the killing of animals for food should be forbidden, as it is a cheap source of protein. But, cruelty to animals and taking them for our entertainment and luxury can always be avoided.

Subrata Chattopadhyay (India): Please explain why should I care if I don't believe in God? If I don't believe that, apart from my pleasure, there is something else I should care about. If I don't believe in the norms and societies which make rules like that. Maybe taking Nietzsche or Foucault to the extreme, can you tell me one good reason why I should be caring about animals? Please don't get me wrong, as I am a vegetarian.

Mary Kalaiarasi (India): We should care for animals for the same reasons as why have we gathered here to talk about ethics.

Subrata Chattopadhyay (India): There are some people who will not come here and discuss about ethics, for example, serial killers, paid murderers. Can you tell him or her one good reason why he or she should care about his or her fellow human beings and other animals?

Mary Kalaiarasi (India): What I feel, I think is, as human beings we have a sixth sense and we call ethics taking care of all of this. Definitely the ecosystem needs to be maintained and of course the animal population cannot be affected.

Morgan Pollard (Australia): I agree with your talk, and thank you for providing pictures, which say a thousand words. I agree with animal rights to the extent that it doesn't compromise ecological rights. For example, some introduced species remove the biodiversity of native species, so sometimes the larger scale units are more important to be preserved than the individual plants and animals involved. If you can protect an ecosystem at the habitat scale, you can also protect the animals and plants within that. So the ecosystem at the habitat scale is the best level at which management and conservation should be directed.

A. Vasala (India): I just want to add one point to the previous question. In order for the ecology to balance we have to give respect to each other.

Mihaela Serbulea (Romania): I would like to draw attention to exaggeration and another to cruelty to animals. Some pet owners dress up their dogs and they take them to massage parlours. In Japan, and some other countries, it is getting into a craze which to me is a kind of cruelty to animals. They are not walking the animals on their own feet; they are carrying the animals as they would carry a baby. I wonder whether the animals enjoy this or not?

Mary Kalaiarasi (India): We feel animals are happy being pets and we feel that we are giving them more than what they want. But I do not think they are comfortable or happy the way we are taking care of them.

Tomiko Yamaguchi (Japan): I just want to respond to the comment, the comment about the Japanese pets situation. Now this animal rights movement, or animal rights concept itself, in my opinion, doesn't really exist in a contemporary Japanese society. To me it seems that the animal rights concept is something really born in Western society so that people are not really aware of the concept that animals have the rights to live naturally.



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