

From the Director's Desk...



The Environmental Information System (ENVIS) has been providing a base for information dissemination issues related to State of Environment of Odisha. Publication of newsletter is one of the major components of the ENVIS Programme; other being information dissemination through web-enabled system and query services. The Centre has been responding to various queries on environmental issues.

We have discussed on various issues in our earlier publication. This issue covers on "**Achieving sustainable use of the planet in the next century: What should we do?**".

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Achieving sustainable use of the planet in the next century: What should we do?

Sustainable use of the planet means living our lives in such a way that we do not deprive future generations of the quality of life that we now enjoy.

There is a very compelling reason for being interested in sustainable use of the planet and that reason is valid no matter where you live. The reason is that human society's life-support system is both technological and ecological. Before the agricultural and industrial revolutions, human life support systems were entirely ecological. However, with the appearance of the agricultural revolution and the industrial revolution, people became concentrated in cities, detached from directly producing the necessities of life, such as food and clothing, and increasingly detached from close association with natural systems. Furthermore, the ecological life-support system, with only occasional localized failures, has provided services upon which human society depends consistently and without change.

Ecosystem Services

Ecosystem services are those functions of natural systems that human society perceives as

valuable. Illustrative eco system services (Westman, 1978) which includes.

- ↪ The capture of solar energy and conversion into biomass, which is used for food, building materials, and fuel
- ↪ The decomposition of wastes such as sewage
- ↪ The regeneration of nutrients in forms essential to plant growth (e.g. nitrogen fixation)
- ↪ The storage, purification, and distribution of water (for such uses as flood control, drinking water purification, and transportation)
- ↪ The generation and maintenance of soils
- ↪ The control of pests by insectivorous birds, bats, insects, etc.
- ↪ The provision of a genetic library for development of new foods and drugs through both Mendelian genetics and bioengineering
- ↪ The maintenance of breathable air
- ↪ The control of both microclimate and macroclimate

- ↪ The provision of buffering capacity to adapt to changes and recover from natural stress such as flood, fire and pestilence
- ↪ The pollination of plants - including agricultural crops - by insects, bats, etc.
- ↪ Aesthetic enrichment from vistas, recreation, and inspiration.

Since humans depended solely on the ecological component of the earth's life support system before the agricultural and industrial revolutions, why are we dependent on both it and the technological component now? The reason was given above in very abbreviated form; namely, that as earthquakes, hurricanes, ice storms and the like have shown, disruption of the technological system (e.g., electricity, water transportation, and food) causes great short term discomfort and even life-threatening dangers. Further, if such disruptions are not expeditiously repaired, they could mean the doom of the society so affected. The earth's present population density and expected population increase - plus the present level and expected levels of affluence globally - require that both the technological and ecological components of the life-support system perform reliably and effectively.

Although science has shown some interest in ecological functions (some of which are viewed as ecological services), not nearly enough information is now available to predict effectively the degree of ecological integrity and acreage of ecosystems necessary to provide desirable levels of services if we know how to make the calculation.

However, we are far from being able to do this. For example, some scientists expect a loss of up to 30-50 per cent of the species on the planet between now and the year 2050 if present practices continue

(Wilson, 1988) yet we have no robust information on the relationship between the number of species on the planet and the delivery of ecosystem services. Similarly, we do not know the degree to which agriculture and forestry system provide certain types of ecosystem services. It would be highly desirable if managed systems were good substitutes for natural systems, although this seems highly improbable. What does seem probable is the possibility that agriculture systems services and managed forests can furnish some eco-system services, although almost certainly not the array that would be furnished by a comparably-sized natural system.

Questions we need to consider

Some illustrative questions involving sustainable use of the planet follow:

- ↪ What will be the scenario in 2050, with particular emphasis on the use and conservation of its natural resources, population size distribution and level of affluence, and technological resources?
- ↪ How can sustainable use be determined, taking into account not only environmental/ ecological aspects but also social and economic ones ?
- ↪ What economic models are most compatible with sustainable use?
- ↪ What activities of human society - especially those related to an expanding economy-have resulted in degradation of otherwise sustainable resources, and how can these activities be modified so as to be compatible with sustainable use ?
- ↪ An informed public is absolutely essential to practicing sustainable use. How can discussions about sustainable development be encouraged

so that all stakeholders have a chance not only to express their views but also to hear and consider those of others ? (This is especially important now that civil discourse is being discarded.)

- ↪ What are the specific short and long term goals that can be tentatively identified now and implemented (and integrated) to enhance sustainability in the future? Setting goals will begin most effectively on a local or regional basis expand to political units (such as countries) or ecological units (Such as bioregions and drainage basins).

Considerations in planning a strategy

For our industries and for municipalities and other political entities, the following illustrative questions are useful in planning a sustainable use strategy that is multigenerational :

- ↪ What resources- ecological and technological - will be needed throughout the next century and beyond?
- ↪ Are present uses of these resources incompatible with sustained use?
- ↪ If the resources are nonrenewable, what alternative resources are available with present technology; if resources are renewable, how can organizational practices be changed to make near-sustainable use feasible?
- ↪ When best management practices have been developed for sustainable use in both technology and ecological terms, what measurements and parameters can be used to validate their effectiveness or show the degree to which they are in error? How should policy makers in industry, government, and non profit and other private institutions communicate the

potential risks and uncertainties of the sustainable-use strategy? How should this be done within the organization for others in top management, middle management and staff not immediately associated with the sustainable use initiative? A particularly crucial issue occurs when industries are closely associated with municipalities or other political entities, which is a very common situation.

- ↪ What are the characteristics of an industry that can successfully compete regionally, nationally, and globally in a sustainable use context during the next century?
- ↪ What are the characteristics of a political unit (e.g. city country, state) that will maintain or exceed present levels of affluence and quality of life and simultaneously make sustainable use possible? There must be an appropriate level at which decisions of various sorts are made e.g. a national welfare system might have prevented much intra-USA migration of the poor.
- ↪ What changes in organizational structure and activities will either foster or impede sustainable-use initiatives between now and the year 2020?
- ↪ What sorts of equity and fairness issues are likely to develop from sustainable-use initiatives?
- ↪ In our attempt to develop a sustainable-use initiative, what impacts might be expected from activities of the World Trade Organization, the International Standards Organisations, the World Bank, the United Nations and similar entities on the sustainable-use initiatives of companies or political entities domestic and global operations? To be more explicit, will be fact that other countries in the global

marketplace have more interest in short-term benefits and less interest in sustainable use affect our competitive position in marketing?

The sustainable-use initiatives are really an implementation of this wish. At the same time, we wish to see those members of society who are enjoying less than optimal benefits increase their quality of life and level of affluence; however, one cannot maximize two variables simultaneously, i.e. affluence and number of people. If not skillfully done, benefiting some of those who are presently disadvantaged could easily impair the benefits and quality of life of future generations. It is of course, much easier to visualize benefiting those who can be observed immediately and more difficult for abstractions, such as future generations. Nevertheless, both deserve attention, and discussions about sustainable use focus on this very important but seemingly difficult problem. This is a very complex subject, difficult to cover in a few thousand words, but it may serve to focus attention on an issue that will affect not only present but future generations.

In the third installment of "The Changing countryside"; the Roanoke Times & World News noted that "Countries are forced to make economic development a priority. The article notes that where residential growth goes, businesses soon follow-farmland that once grew crops is now abloom with subdivisions. But there is justifiable apprehension among the citizenry that continuation of these trends will produce a situation that will degrade the amenities of which they are justifiably proud and which make the quality of life. The trends described by The Roanoke Times & World-News cannot continue indefinitely, or even for many more years, without irreparable damage to the quality of the country-side. Sustainable growth may then become a contradiction in terms- growth in human cells that

gets our of hand is called cancer, and expansionist growth cannot continue forever on a finite planet.

Another type of economic growth is growth in quality. in the 1940s, Boeing switched from propellerdeiven aircraft to jets. This involved a major redesign of its production facilities, retraining of personnel, and a number of other concomitant changes. Society must be repaired for similar changes to maintain quality.

Sustainable use of the planet requires that we not destroy our ecological capital, such as old-growth forests, streams and rivers (with their associated biota), and other natural amenities. If we alter the countryside by filling it with factories, shopping malls, and housing developments, the features that we enjoyed before it was altered cannot be enjoyed by future generations. Nor will they benefit from the industrial and urban growth to the same degree that we think we will. In fact, as such growth ages and deteriorates, it may cause more problems than the benefits are worth.

Sustainable use of technology requires that it should be maintained, updated, and changed periodically without necessarily altering the space developed to it. In frontier societies, the quality of the area in which one lives can be impaired and when dissatisfied, one can move on to an area that still retains these qualities. Now, only extremely wealthy people can do this and they are paying a bigger and bigger price for doing so. The average citizen has to keep a quality environment where she or he lives, and this is what is meant by sustainable use. The term growth-as commonly used to mean an increase in quantity - will have to change to mean an increase in quality, or sustainable use of the planet will not be possible and future generations will lead impoverished lives compared to those of this generation.

Resources and political positions needed throughout the next century and beyond

- ↪ Haphazard growth will destroy any possibility of sustainable use of the planet for future generations; they will not be able to enjoy the same amenities we now enjoy.
- ↪ Regional plans will have to be developed to determine how much farm land, wild land and urban areas are necessary for future generations to enjoy.
- ↪ Once the above has been determined, those responsible for enforcing zoning must be more rigorous in enforcement than they now are; however, pressure to relax regulations grows with population pressure and with increases in monetary value assigned to that which is protected. Natural tracts are being eroded irreversibly a few acres at a time. Excretions to zoning regulation may seem acceptable to many people if viewed in isolation from all other exceptions, but in the aggregate, as the series in The Roanoke Times & World-news clearly demonstrates they are disturbing to people with high expectations for their children and grandchildren.
- ↪ Citizens who enjoy the benefits of good management of private property by others should reciprocate by managing their property in a way that is compatible with sustained long-term use and with the larger ecological landscape of which they are a part. For example, a fast-food outlet at the entrance to Pandapas Pond, a nature area near Blacksburg, would be inappropriate, even if it were on private property and regulations allowed it.
- ↪ Private property owners not only have rights, but they also have responsibilities to their neighbors. Profiting financially from inappropriate use of one's land is not something

one would like one's neighbor to do, and therefore, if we give neighbors the respect we expect from them, they should reciprocate,

- ↪ Short-term needs must sometimes be postponed so that future generations will not be deprived of necessities.

Behavioral change

Many years ago, B.F. Skinner noted that behavioral change is unlikely unless the consequences are readily apparent. Even then as we have seen from the spread of AIDS and other health problems-individuals frequently fail to change their behaviors because they feel that they are somehow exempt from the fate of others. There is also a touching but unjustified belief that there will always be technological solution to all of society's problems, even if the technology is not now available. For example, we store hazardous wastes that may not adequately decay for over a thousand years even though the technology for such long-term storage is unproven. Hazardous waste burial grounds of uncertain stability proliferate, sustainable use of the planet as we now know it will no longer be an option.

Unfortunately, major catastrophes seem to be the only way to produce major shifts in societal behavior. Even then, as are actions to earthquakes and floods have demonstrated, change is reluctant and slow because people feel that the disaster will not happen again soon. Probably, we will continue on our present path until conditions become so clearly unacceptable that we are willing to alter our behavior to return to a more acceptable set of conditions. It is not clear, however, if this can indeed be done. Alternatively, if we live dangerously, fate in the form of AIDS, famines earthquakes and floods, or increasingly hostile interactions among people will change our behavior for us.

The flooding problems in many parts of the world illustrate the effect of small decisions can make. Each decision seems harmless and sensible in isolation from other decisions, but in the aggregate, they can disrupt lives. The loss of wetlands result in reduced natural flood storage capacity, increased impervious surfaces roads, parking lots, and buildings, for example increased runoff due to devegetation. People comment that the floods seem worse every year but fail to relate this to their massive alteration of natural systems on both public and private property. If owners are permitted to make any changes they wish are they then legally and financially responsible for the huge monetary losses now occurring? If there are no consequences to having unlimited rights to alter private and public property, can we expect legislators and citizens to alter their behavior?

The sustainable-use question is important because it forces us to examine our personal belief our hopes and expectations for future generations and our regard for the well being of our neighbors. If these considerations modify behavior sustainable use of the planet may be possible.

Restoration of Ecosystem Health and Integrity

Many of the worlds ecosystem have been seriously damaged and practically all are not furnishing the ecosystems services that they might well furnish in more robust condition. Restoration or rehabilitations ecology will be essential, particularly in view of the threats of global warming and other indication of global ecological imbalance. Without the cooperation of the developing countries, global environmental problems can not be solved. Failure to reach a global consensus will ensure that ecosystem health and integrity will be even more seriously impaired. Methane from cattle

or carbon dioxide from inefficient furnaces in a developing country will definitely have an impact on the world's climate and since many of the pollinators and insect eaters are migratory, destruction of their habitats in one part of the world will mean their elimination in another part.

What are the causes of observed ecological disruptions and what can be done to restore biotic integrity? While the penultimate cause of ecosystem degradations can be attributed to waste discharge, poor land use practices, habitat alteration and other influences, the ultimate cause is human population growth. The growing human population co-opts significant ecological resources, reducing the natural productivity of ecosystems. We are now in a state of controlled panic about the rate of species loss globally and the reckless expenditure of ecological habitat (top soil, forests, groundwater and pure air) are outraged.

Human population growth and dependence on fossil fuels are the clear causes of real or potential global climate change. Regardless of the validity of predictions of global warming related to historical and future assaults on the atmosphere, the continued growth of the human population will have dramatic effects on local ecosystems. Population growth is most dramatic to developing countries where the infrastructure is unavailable to deal with the clearest ecological threats. If energy resources are not expanding, then growth will be limited by the global availability of fuels to fire development. For developing nations, with same level of energy independence, the future road will be clear and the input of combustion products will increase or the products of nuclear fission will need new burial grounds. Only by adopting radically new ideas integrating management and ecosystem science, ecological integrity can be maintained.

One Day Workshop on
CLIMATE CHANGE & ENERGY CONSERVATION CHALLENGES

22nd January, 2014

Venue: Hotel Swosti Premium, Bhubaneswar



(From L-R): Dr. Sailabala Padhi, Director, Centre for Environmental Studies; Dr. D.K. Behera, Sr. Environment Scientist, SPCB, Odisha; Dr. Ajit Kumar Pattnaik, IFS, Project Director, ICZMP, Odisha; Shri Sashi Bhusan Samant, IFS, Director, Environment-cum-Special Secretary, F & E Department; Shri Rajiv Kumar, IFS, Member Secretary, SPCB, Odisha during a workshop on "Climate Change & Energy Conservation Challenges"

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