Ecosociocentrism: The Earth First Paradigm for Environmental Sustainability and Sustainable Development

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ABSTRACT

Environmental destruction and degradation that have occurred on planet Earth can be attributed largely to the current neo-liberal economic development paradigm, that considers Nature as simply the resource to be extracted and processed for human consumption and material growth. This paradigm does not consider the intrinsic values in Nature, including the values of life support-services, and goods of the natural ecosystem in the economic valuation system, and therefore, maintaining a healthy, productive, and resilient natural ecosystem becomes simply outside its analytical framework. The most important question that needs to be embedded into any development model is the question of values. If the assumptions of the current economic development model are not restructured and the ecological facts and values are not integrated into economic development model, humanity will inevitably face existential crisis on planet Earth. The scientific epistemology that embodies ecological principle of diversity, ecosystem resilience, interconnectedness, self-organizing complexity, and life sustaining environmental services provides the basis for building social and environmental sustainability. This necessitates the need for the integration of environmental ethics into development framework that can provide the guiding principle for human behavioral conduct. It is argued here that there is a need for a pragmatic environmental ethical paradigm that can integrate both the instrumental and intrinsic values in Nature and promote sustainable development that can lay the foundation for eco-civilization. Recognizing our fundamental interconnectedness with other life forms, self-organizing complexity of the living system and the interdependent nature of our existence, it behooves that development be pursued with a pragmatic environmental ethics that recognizes both the instrumental and intrinsic values in sociosphere (society) and ecosphere (nature). Ecosociocentrism, the proposed ethical framework, recognizes instrumental and intrinsic values in ecosphere and sociosphere. Ecosociocentrism envisages to integrate these values prevalent in ecosphere and sociosphere. Ecosociocentrism claims to provide a pragmatic environmental and development ethical framework for human behavioral conduct to live sustainably in good stewardship with Planet Earth, thus, paving the way to a new era of ecocivilization.

Keywords: Intrinsic and instrumental values, Interconnectedness, Dominant paradigm, Ecosphere, Sociosphere

METHODOLOGICAL FRAMEWORK

The methodological framework includes critical review of current development paradigm, followed by the analysis of the evolution and organization of natural system (planetary ecosystem) and the values associated with their attributes, and finally the conceptualization of a development paradigm that advocates facts and values-based development ethics which embraces value pluralism integrating instrumental and intrinsic values in nature. In the first section, paper examines the inherent assumptions and values of the dominant utilitarian development ethics responsible for destruction, degradation, and ecological overshoot of planetary ecosystem. In the second section, paper attempts to bring perspectives on how living systems or ecosystems evolve and organize themselves in nature and how their attributes should be valued instrumentally or intrinsically or with value pluralism recognizing both instrumental and intrinsic values in nature. The paper reviews how facts and values are used in the description of reality and argues that facts and values cannot be treated separately and exclusively in describing reality. In the final section, the paper advances a framework of a new development paradigm called "Ecosociocentrism: The Earth First Paradigm". The paradigm recognizes instrumental and intrinsic values in nature and presents a conceptual framework and principles postulating why human social, economic and technological system (sociosphere) must remain within the regenerative capacity of planet Earth (ecosphere) to realize environmental sustainability, sustainable development goals, intergenerational equity and flourishing of all living entities in nature.

1. DOMINANT DEVELOPMENT PARADIGM

The prospect for environmental conservation and sustainable development appears bleak in the context of continuing current neoliberal development paradigm without alteration in its basic assumptions, values, and approaches. The development strategies and policy instruments to address social and environmental problems of developing countries differ markedly from that of developed countries because of the different level of socio-economic development and environmental problems. Different sets of policies and development strategies need to be considered for developed and developing countries if the pace of environmental destruction and degradation is to be minimized and the social goal of sustainable development is to be pursued and materialized (Upreti 1994). For this, it is necessary to come up with a new value-based development approach that provides balanced and comprehensive perspective on both social and the ecological/environmental dimension of the problem.

Brown (1987) argues that complex environmental problems that require critical analysis using scientific knowledge and wisdom are often delegated to scientific experts, consequently, the ethical questions that are embedded in these problems are often concealed, lost, or distorted in scientific communication, because the process requires that facts and values be separated. The values that cannot be ignored are translated into technical economic language in terms of economic costs and benefits analysis involving quantitative estimates at the expense of qualitative ones. This results from the narrow scientific training of technical experts which leaves them unprepared to deal with the value based ethical issues (questions) in environmental public policy of nature conservation (Brown 1987). Ecologists, environmental economists and scholars in the field of policy analysis have argued for the inclusion of ethical evaluations in the analytic processes, however, most development practitioners in the policy field not only avoid analyzing moral or ethical issues but also think it unnecessary on the ground that such normative analysis is impractical or undesirable (Johnson 1992; Jackson 2017; Raworth 2017; Nash 1989; Upreti 1996; Matthews 1989; Kasser 2017; Korten 2018). One important reason for shunning ethical inquiry is that it frequently threatens the professional and political interests of both the development professionals and policymakers. They resist the potential challenges of moral evaluation to maintain their status quo.

The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) (the science policy body of the world nation states) has recently summarized the nature's values into three broad categories, namely non-anthropocentric (intrinsic), instrumental and relational. Pascual

et al. (2017) argue that a pluralistic approach to recognizing the diversity of values is required for the transformative practices that aim at sustainable futures which requires recognizing and addressing power relationships across stakeholder groups that hold different values on human nature relations and nature's contribution to humanity. These wide spectrums of values generated by the interplay of different and contrasting worldviews (anthropocentrism, ecocentrism & relational etc.) produce diverse perspectives on nature protection and conservation, intergenerational equity, and ways of achieving sustainable development goals. The biggest challenge is the reconciliation and recognition of these value perspectives and their integration into the decision-making processes that is dominantly propelled by the economic utilitarian value system that recognizes exclusively the instrumental values of nature (value monism) let alone mention the intrinsic and relational values.

A critical study on the implementation of policy recommendations of IPBES by the powerful nation states (USA, China, India, Brazil, & many others including EU) will reveal that its policy recommendations for the recognition of intrinsic and relational values of nature other than strictly instrumental values find their ways to the dustbin. This is because of the inherent flaws in the assumptions of current market driven neo-liberal development growth paradigm that thrives on ever increasing material consumption which treats nature as the resource to be extracted and consumed (Matthews 1989; Naess 1999; Upreti 1996). Unless its underlying assumptions and the principles are restructured and the impossibility of ever increasing infinite economic growth is duly recognized and is replaced by a steady state economy that operates within the regenerative capacity of the planet Earth (planetary ecosystem), the intergenerational equity, protection and conservation of nature and sustainable development are simply the rhetoric of empty talk and a Sisyphean myth (Daly 1993; Upreti 1994; Jackson 2017; Bonnet 2017; Korten 2017; Ward *et al.* 2016).

The fundamental question is: is there a possibility of restructuring the fundamental assumptions of the market driven neo-liberal economic growth model? Are the political leaders of powerful nation states, development professionals, powerful international financial institutions, the corporate world, and the growth maniac economists who drive the decision-making processes willing to listen and consider changing the trajectory of current ecologically hostile growth paradigm? This is fundamentally a critical question that defines what kind of development we human want and what kinds of ethical and normative values should guide human behavior in their relations to nature and other living entities (species and ecosystems) in nature.

Economic utilitarian value ethics associated with a belief in infinite economic and material growth as the basis for good quality of life needs to be altered to understand the diversity of values of nature's contribution. Application of value pluralism (integration of instrumental, intrinsic and relational values) requires not only well-grounded scientific epistemology that enables the trans-disciplinary collaboration across a broad range of natural and social sciences but also ensures the development of widely acceptable valuation approaches and techniques that can yield the intended results of intergenerational equity, nature protection, conservation and sustainable development goals (Jackson 2017; Ward *et al.* 2016; Lent 2017; Brown 1987; Pascual *et al.* 2017). Though it is extremely difficult, if not impossible, to come up with reasonable value pluralism (integrated values system), its acceptance and effective application largely depends upon the understanding and the willingness to consider on the part of decision makers on one hand and the collective ecological consciousness of the masses of the people on the other hand. Science education polices, in general, and environmental educational studies and research, in particular, play critical roles in raising environmental awareness among younger generation and preparing a new batch of environmentally oriented politicians and professional decision makers.

1.1 Ecological Overshoot

The speed at which ecological overshoot is accelerating clearly indicates that existential threat is looming over humanity. This is vindicated by the fact that current resource extraction and consumption patterns have depleted Earth's natural resources at a much faster rate than they can be replenished. The march towards global catastrophe cannot be halted if government policies emphasize

high GDP growth as a national priority and transnational corporations relentlessly pursue greater profit returns by ransacking the Earth, humanity will continue accelerating its fate towards global catastrophe. The world's current consumption is running at 45 % above planet Earth's sustainable biocapacity (regenerative capacity) which means that humanity is rapidly depleting the Earth's forests, animals, insects, fish, freshwater, and the topsoil on which crops are grown. As Raworth (2017) points out humanity has already transgressed four of the nine planetary boundaries (biodiversity, land conversion, nitrogen and phosphorous loading and climate change) that define humanity's safe operating space, and yet global GDP is expected to increase more than double by mid-century with potentially irreversible and devastating consequences. Empirical data on human use of biophysical resources (biocapacity) indicate that our global ecological footprint is growing rapidly, further overshooting what the biosphere can provide and absorb accelerating the shrinkage of available biocapacity on which humanity depend (Raworth 2018; Jackson 2017). Globally humanity is consuming nature's services much faster than nature can regenerate and assimilate the waste throughput they produce. The most important question that needs to be embedded into any development model is the question of values. If the assumptions of the current economic development model are not restructured and the ecological facts and values are not integrated into economic development model, humanity will inevitably face crisis in both, sociosphere (society) and ecosphere (nature). In 2017, over fifteen thousand scientists from 184 countries issued an ominous warning to humanity that time is running out to shift the course away from our current trajectory (Lent 2018).

Economists consider only the tangible benefits (the commodity values) determined by market forces and consequently overlook the ecological values of the life-support services and goods provided by diverse biotic community in the ecosystem even though planetary ecosystem is the source of all the material inputs and services necessary to produce man-made goods and services. The life support-services and material inputs of natural ecosystem must be considered an important component of the economic production and valuation system and the principle of opportunity cost ought to be applied to maintaining a healthy natural ecosystem (Costanza *et al.* 2018; Upreti, 1994; Daly, 1993). Entire ecosystems should be valued for the goods and the services they produce. The fact that the health of economic system which comprises human happiness and well-being is intricately and dialectically interlinked with the health of ecological systems makes it clear that our policies and valuation approach must be guided by the ecological laws and the values of protecting and maintaining the health of the ecological systems.

It is argued here that ecosystem health should be the central concern of environmental policy and strategy to guide environmental and public values such as human health, economic, aesthetic, and moral. It should be the basis for protecting the processes that maintain and enhance the proper functioning of ecological systems on which depend the well-being of human being and other living beings in nature. Therefore, ecosystem health and its protection should constitute the centerpiece of the modern development endeavor that requires an ethical value-based development approach that can reconcile the satisfaction of human needs with protection and conservation of nature and guide humanity to live within planetary means.

1.2 Development Ethics

After the publication of widely cited report, Our Common Future (1987) by the World Commission on Environment and Development (WCED), the concept of sustainable development has undergone a considerable change. Number of scholars ever since the publication of this report have profoundly elaborated on the basic formulation and added relevant social and ecological dimensions of sustainability. Environmental sustainability necessarily means conducting anthropogenic activities within the limits of the regenerative capacity of biophysical environment. Social sustainability necessarily implies the patterns of resource uses, resource ownership and resource distribution. Without integration of environmental/ecological facts and values into development model that recognizes the need to limit human activities within planetary means in ecosphere (nature) and the fair, inclusive and equitable development patterns in sociosphere (society), sustainable development becomes a Sisyphean myth (Upreti 1994).

The principal reason why human beings act in ways that are destructive to ecological systems is because human beings do not see the interdependencies and interconnectedness between natural systems and their own lives. Human civilization is on the road to self-destruction unless humans give up thinking in linear material ways. The biggest predicament humanity faces today is that, on one hand, we want to preserve our natural environment; on the other hand, everything we do to grow our economy and increase our material standard of living disrupts and destroys the natural environment and our relationship with nature. Unless we raise our consciousness and learn to think in new ways to escape the pathology of our wrong thinking, the trajectory of the human civilization towards its path of annihilation cannot be changed. As Albert Einstein eloquently stated, "No problem can be solved from the same level of consciousness that created it".

This inherent contradiction that human beings are distinctly separate and independent of the rest of nature needs to be debunked and replaced by the perception and the understanding that human beings are as much a part of nature as nature is part of the human beings, the web of inseparable interconnectedness. This is even more evident given the ever increasing and ecologically hostile modern consumerism of the plastics and synthetic products that are critically undermining the regenerative capacity of planet Earth (lands & oceans). For example, global plastics production in 2019 was 368 million metric tons; researchers have estimated that more than 8.3 billion tons of plastic has been produced since the early 1950 and about 60% of that plastic has ended up in the natural environment (UNEP 2021). Plastic waste has become so ubiquitous in the natural environment that scientists believe it could serve as a geological indicator of the Anthropocene era (Wilson 2021). If current trends of consumption continue, by 2050 the plastic industry could account for more than 20% of the world's total oil consumption and oceans could contain more plastics than fishes by 2050 (Wilson 2021; Lent 2018). Environmentally and ethically conscious consumerism has vital role to bring a shift in consumer mindset and it can only be done through environmental and ethical education, and dissemination of scientific facts and values. The de-alienation of humanity from nature is possible only through ecological facts-based value consciousness and wisdom.

2. AUTOPOIESIS AND ORGANIZATIONAL COMPLEXITY IN NATURE

Maturana and Varela (1978) have been credited for developing a theory of living system that was closely related to Gregory Bateson's work of 1972. Their works focused on autopoiesis, the pattern to be found inside of all living systems. Autopoiesis is the very essence of the living system that creates and sustains itself and generates life while maintaining its overall structure and organization. It is understood as the autonomy of self-organizing systems, an ongoing self-creative process that exists within all living systems (Maturana & Varela 1978).

It is recognized that a linear concept of causality cannot adequately explain the interactions that take place within complex systems. The classical linear scientific paradigm studied the carefully isolated phenomena that exhibited unidirectional cause and effect relationships that occur between interacting parts. As Capra (1999) points out, the classical epistemological paradigm cannot explain the negentropic processes in the growth and evolution of living organisms. The complex interactions of biological systems involve regularities that seem to defy the second law of thermodynamics according to which entropy always increases. With every transformation of energy, there is some measure of that energy which is lost; ultimately pushing the universe toward randomness and disorganization (Daly *et al.* 1996). Critics (Capra 1996 & 1999; Kauffman 1990; Bateson 1972; Maturana 1987) indicate that the second law of thermodynamics cannot adequately explain the evidence of continued biological negentropy. They argue that in their life-forms and patterns of interactions, living organisms have not tended toward randomness and disorganization. Living systems entail a wide range of phenomena encompassing individual organisms, ecosystems, and human social systems. Living systems differentiate, evolve, and maintain increasingly complex forms of social and self-organization. Such self-organization in biological

system is an anti-entropic phenomenon responsible for the evolution of order and increased complexity within bio-ecological systems. The morphogenesis embodied in living systems exemplifies negentropic or anti-entropic qualities that apparently defy the physical laws of nature. Living systems represent successful maintenance and increase of order within the prevailing thermodynamic drift towards randomness and disorganization (Weckowicz 2000).

2.1 Instrumental and Intrinsic Values

The proponents of deep ecology (Naess 1999; Devall 1999 & Sessions 1999) reject the man-in-environment image and argue in favor of the relational total-field image which not only dissolves man-in environment model but also recognizes the intrinsic nature of this relational total-field image of interconnectedness in nature. In my view, this state of human interconnectedness with other life forms and the self-organizational complexity of living system (planetary ecosystem) and the interdependent nature of existence, qualifies to have intrinsic value. With the recognition of this value, it behooves that we maintain the resilience and the beauty of this shared and embodied web of interconnectedness of which Homo sapiens is not only the keystone component but also the dominant driver. It is imperative to realize that values and ethics do not originate from vacuum or any external source but emerge naturally from experience and understanding of our inseparable interconnectedness with all life forms and living systems that manifest as the increased self-organizational complexity in nature which, we can safely call an intrinsic value for itself without digging deeper into any metaphysical abyss. Therefore, human actions and behavior that tend to preserve such intrinsic value (self-organizational complexity) in nature should be considered not only ethical but also necessary.

It is argued in this paper that there is a need for a new ethical paradigm that can integrate instrumental and intrinsic values in nature and universally promote sustainable development and lay the foundation of eco-civilization. Ethics has an important role in critiquing and reforming the dominant social development paradigm. It is fundamentally important to understand how our social and ecological values are determined and shaped by our worldviews within the framework of which, we perceive and interpret the worldly phenomena around us (Kuhn 1970). Our world view has conditioned our perception and understanding of the role of ethics in relation to the issues of development, environment, and conservation. The professional conservationists stress the efficient long-term utilization of natural resources and recognize only the instrumental values whereas eco-centrists (deep ecologists) stress the preservation of intrinsic values inherent in nature.

Buddhist philosophical view of interconnectedness and dependent co-origination (pratitya samutpad) and the ethical conducts of non-violence and reverence for life has the potential for liberating humanity from present predicament (Odin 1997; Wilson 1999; Schweitzer 1993; Capra 1993). Buddhism provides profoundly deeper sense of reverence for life in all forms to symbolize and identify with creation in nature and provides moral perspective against human excesses in all forms. From a Buddhist Eco-Dharma perspective, we ought to have a sense of sanctity for life and life processes on Earth that provides moral imperatives for their protection and preservation. It can be said that to develop a coherent and powerful environmental ethics, Buddhism offers the most pragmatic and useful perspective.

The physicist James-Lovelock (1991) postulated a hypothesis (Gaia hypothesis) that Earth was a self-regulating system and has the capacity for homeostasis implying that it carries its internal adjustment through self-regulation (positive and negative feedback mechanism) in response to the changes to the outer world. Gaia hypothesis is close to "System Theory". System theory (theory of living system) provides the most logical formulation of the ecological worldview that has emerged as an alternative paradigm. One critical insight rendered by system theory of life is that life and cognition are inseparable, and the epistemological process is a self-organizational process. The conventional model of knowledge is an image of independently existing fact which is the model derived from classical physics. The system theory views knowledge as the part of the process of life, a dialogue between object and subject,

knowledge, and life, and therefore, facts and values are inseparable from each other (Capra 1993 & 1999; Schneider 1994; Wilson 1998). Gaian and system theory entail a whole new approach to the analysis of environmental policy, an approach that is both fact and value-driven rather than exclusively fact-driven. This approach will help us to ask questions about global environmental problems and to explore system-oriented solutions for resolving these problems. As the ancient Greeks realized, "Gaia would reward mankind with her bounty when treated well but equally she would revenge abuse" (Lovelock 1988). The choice is ours as to how we want to treat Gaia (planet Earth)?

2.2 Facts and Values in The Description of Reality

Value is something we consider an ideal state of a thing, and the fact is the manifestation of that value. Harris (2001) asserts that values are intertwined with facts and give meaning with the help of facts. In the absence of values, facts are meaningless and vice versa. Weber (1949) thinks that values and facts are interrelated and interdependent each affecting the other and, therefore, they cannot be separated from one another in the description of a conceived reality. As Barton (1992) points out empiricism is the gathering of data through observations by human senses or calibrated scientific instruments. While conducting empirical study, the investigator describes the interaction between human senses and the unit of the study being observed. It cannot be denied that facts give meaning through the help of values and values through facts, and both become pre-requisite and mutually inclusive of each other.

Objective science attempts to distinguish between value judgments and empirical knowledge and try to filter the factual truths. The facts-values conundrum consists of two parts; the gathering, systematizing, and synthesizing of information (assessment) is the factual part and the use of this information in decision making process consists of the value part. From a philosophical perspective, fact-value distinction is difficult to maintain because how we see facts strongly depends on our preconception and our value system (Hanson 1958). Scientific epistemology and human values are intertwined, mutually dependent and shape each other. A neutral or objective assessment of fact and value is impossible, and they must be assessed together (Hofmann *et al.* 2015). It is difficult to infer a conclusion about what one should do or what is valuable in a given situation only from the fact about that situation. It becomes necessary to analyze the underlying value assumptions associated with the fact or the fact needs to be complemented by some value assumptions (Jonas 1985).

One consequence of the shift from a unitary to a pluralistic system of analysis (which is implicit in cognitive epistemology) is the rejection of value-free descriptive science. As Capra (1993) argues both epistemology and physical theory have been driven toward the conclusion that there exists no single, uniquely correct description of the physical world. The problem, however, is not that no consistent and accurate descriptions of the world exist; rather, there are too many. The world of experience is unavoidably complex, and there are many valid perspectives and scales upon which to describe and evaluate nature. From this, it follows that there is no unitary picture of reality against which a paradigm can be compared. To choose a paradigm is to choose one way of describing the world, a value-based approach.

If facts are understood in proper context, what we call facts can become the values and vice versa. For example, if we consider it to be true that human existence and existence of other beings depend on the ecological processes and integrity of the planetary ecosystem as facts based on ecological and scientific knowledge we have acquired so far, then we certainly ought to value those ecological processes and integrity of planetary ecosystem and, hence, do our best to maintain and enhance those ecological processes and the integrity of planetary ecosystem. In this case, ecological processes and integrity of planetary ecosystem are both the description of facts and the values and cannot be separated from each other.

We can see that the preservation of integrity, resilience, and the beauty of the biotic community as Leopold (1949) so emphatically stated, is possible only through the protection and preservation of ecosystem health and processes. The

concept of ecosystem health entails its capacity for resilience, self-organization, and the maintenance of the functional integrity of the ecosystem over time. This is a holistic and useful perspective which entails that preserving the integrity of ecosystems and ecosystem processes is environmentally more crucial than protecting the individual species or an entity of an ecosystem or members of a species. The quantification of ecological services becomes much easier and tangible when it is pursued from ecosystem health perspective. The functional integrity of all the elements and the component of the ecosystem is pre-requisite for maintaining the health of the ecosystem. Norton and Ulanowicz (1992) argue that ecosystem health should be the central concern of any policy and management strategy to guide ecologically understood environmental management and, therefore, all public values, such as human health, economic, aesthetic and moral should depend on protecting the processes that support and maintain the health of ecological systems.

The web of interdependence and interconnectedness has value in-itself and humans must make every effort to protect and prevent this web from breaking down. Leopold (1949), the most ardent advocate of environmental ethics, argued for a holistic, ecocentric morality called 'the land ethic' which affirms that the life-forms that share the planet with people should be allowed to live as a matter of biotic right regardless of the presence or absence of advantage to humans. Leopold (1949) recognized the intrinsic value of the biotic community that formed the basis of his famous Land Ethics which states: 'A thing is right if it maintains the integrity and the beauty of the land community, wrong if it does otherwise'.

Leopold's ethical system recognizes this web of interdependence and interconnectedness and includes the whole of nature (the integrity of land, plants, animal, water, the air and everything that exists) and human obligations to respect and maintain this integrity. It can be argued that long standing existence in Nature carries with it an unimpeachable right to the continued existence of even those species that have apparently no significance to human. It is their existence value because they evolved and existed in the ecological system. Naess (1999) recognizes the intrinsic rights of all species and assumes a moral duty to protect and preserve them.

In his best-selling book 'The Web of Life', Capra (1996) formulated a conceptual framework for understanding the comprehensive theory of living systems by combining the study of the pattern and the structure with the living systems theory. This new understanding offered radically a new way of conceiving reality governed by patterns, structures and processes. According to Capra (1996) pattern, structure and process are different but inseparable aspects of the phenomenon of life and, therefore, to understand any living system, we must answer three questions: what is its structure? What is its pattern of organization? And what is the process of life? This framework is called a holistic worldview which sees the world as an integrated whole rather than a disassociated collection of parts. In a broader perspective and deeper sense, this can also be called an ecological worldview which recognizes the fundamental interdependence of all phenomena including individual entities and the societies embedded in the cyclical process of nature. This provides the basis for the evolution of system thinking that emphasizes the whole rather than the parts. System approach replaces the classical approach that postulates that the behavior of a complex system can be analyzed in terms of the properties of its parts. System thinking posits that properties of the parts are not intrinsic, and they can be understood only within the context of the larger whole. As Capra (1996) succinctly stipulates the essential concept of interdependence and interconnectedness of system theory that restores human connection to the entire ecology of the natural and human communities:

The theory of living systems discussed in this book provides a conceptual framework for the link between ecological communities and human communities. Both are living systems that exhibit the same basic principles of organization. They are networks that are organizationally closed, but open to the flows of energy and resources; their structures are determined by their histories of structural changes; they are intelligent because of the cognitive dimensions inherent in the processes of life. We need to revitalize our communities including our educational communities,

business communities, and political communities so that the principles of ecology become manifest in them as principles of education, management, and politics.

As the current mainstream development paradigm has been driving our current civilization inexorably toward planetary breakdown and the voices and the alternative worldviews toward a new form of civilization has been gaining ground, increasing numbers of people around the world will come to realize that a fundamentally different alternative development paradigm is needed. It is inevitable that humanity is headed for the greater transformation in its history whether it is in the form of global ecological collapse or a metamorphosis to a new foundation for eco-civilization. The biggest challenge of development ethics is to re-envision the development itself that can maintain both ecological and social integrity. It also requires of the scientists, development professionals, thinkers, philosophers, and ethicists to work in close collaboration to translate the ecological and social axioms of sustainable development into reality. It is clear from the preceding discussion that without maintaining social and ecological integrity, it is impossible to conceive sustainable development and well-being of human and other life forms on planet Earth.

Development should be viewed as a process that brings qualitative improvements in the life of people and the environment in which they live and should be measured by the quality of life and the environment (both). Improvement in the quality of life is not possible without maintaining the quality of environmental resource base (healthy, resilient, and productive ecosystems). The human induced environmental impacts have manifested in the wanton destruction of planetary ecosystems (biodiversity and ecosystems processes and wilderness) which produce life-supporting and sustaining environmental or ecological services. The life sustaining and enhancing environmental services and processes on which depend the very existence of human beings and other life forms in nature must be considered to have intrinsic values (the inherent value). Human caused environmental destructions and degradations that undermine the security and survival of all life forms including human beings must be considered immoral. The scientific epistemology that embodies environmental ethics and embraces ecological principle of diversity, ecosystem resilience and interconnectedness, self-organizing (autopoietic) complexity and life supporting environmental services provide the basis for building environmental and social sustainability. This necessitates the need for integration of environmental ethics and values into development framework and guiding principle for human behavioral conduct.

It can be argued from phenomenological and relational perspective that things in nature exist in relationship in their very occurring and becoming (dependent co-origination). The biophysical things, the biome and the ecosystems that exist in their manifold facets constitute the complex nexus and web of interdependence and interconnectedness. This is central to the existence of all living system including human and it must receive a non-anthropocentric interest that can recognize its intrinsic values. Is not humanity better off with the recognition that human beings are an integral part of the nature just like any other being and that the web of interdependence and interconnectedness is what essentially sustaining the system and that the breakdown of this web will inevitably endanger the existence of Homo sapiens as a species?

3. ECOSOCIOCENTRISM: THE EARTH FIRST PARADIGM

Ecological goods and services provide the basic infrastructural foundation upon which human economic and social systems have been built. For the sustenance of human economic and social systems and intergenerational equity, ethically the most powerful argument for sustainable development is to maintain natural ecosystems in a functionally healthy state with minimum disturbances so that they can generate ecological goods and services across multiple human generations. Human driven ecosystem destruction and biodiversity extinctions is an irreversible process, which undermines the ecological sustainability of human economic and social system endangering the very survival of humanity and all life forms. All ecological goods and services are in the domain of public goods and must be protected from individual and corporate greed and ecologically

hostile consumerism and preserved for the greater good of humanity and the living system.

It is sadly disappointing to note that environmental services produced by natural ecosystem, despite being so vitally important for our own existence, have not received an adequate attention even from the scientific community. The scientific community has committed to a piecemeal approach of preserving and conserving a specific organism here and there let alone talk about the economists and politicians who refuse to accept the fact that the human economic system is dependent on the larger planetary ecosystem and that it must operate within the bound of ecological laws for its own survival and stability. The science of ecology has established that things in nature are biophysically interdependent, individuals are sustained as integral members of local ecosystems, which, in turn, are nested in overarching regional or global systems.

Life becomes impossible when the self-organizing or autopoietic capacity of ecological (biological) system is damaged and destroyed beyond certain threshold or resilience. Higher the amount of ecological and cultural diversity in nature and society, greater is the ability of natural and social system to adapt and cope with the disaster and crises because such diversities have evolved through a long evolutionary process of natural and cultural selections. By maintaining and preserving ample amount of ecological (biological) and broad range of cultural diversity, the natural and the social systems retain a far greater organizational flexibilities, options, and adaptive solutions to the emergence of new crises. I argue that political economy decisions must be made within the epistemological paradigm of ecology if we truly desire sustainable development and human happiness and if sustainable development is not to become Sisyphus's myth. The fact that the health of economic and social system which encompasses human happiness and well-being is dialectically interlinked and intertwined with the health of ecological systems, makes it clear that our development policies must be guided by the ecological laws, wisdom, and the values of protecting and maintaining the health of these ecosystems. Planet Earth is the niche of the Homo sapiens. No living organism can survive if it destroys its own niche. Should human techno-cultural evolution be the cause of the destruction of the very natural niche of its own existence? Homo sapiens must seek the answer in the rich history of its own evolution before it is too late.

Natural systems are characterized by certain dynamic processes, attributes or properties that evolved or originated through million years of evolutionary processes. These attributes or the properties of natural system can be considered to have certain values (instrumental & intrinsic) as depicted in the figure 1 (conceptualization of instrumental and intrinsic values in nature). Self-organizational complexity, resilience, diversity, and interconnectedness are the attributes of the natural system, and these attributes can be regarded as both instrumental and intrinsic values. Recognition and protection of these values in the natural system on planet Earth is the essential condition for sustaining the future of mankind and the living system.

What we need today is the development ethics that recognizes these values in planetary ecosystem and guide human actions and behavior to live within the planetary means. It calls to our attention for the moral necessity of behavioral changes from anthropocentric worldview that regards values in nature as only instrumental not intrinsic. This value judgement must be critically re-examined in the light of current ecological crisis and the recognition of inherent values of self-organizational complexity and the negentropy of living system (ecosystem and ecosystem processes) in nature. These values in nature (self-organizational complexity, diversity, resilience, interconnectedness etc.) should be treated as both intrinsic and instrumental but not mutually exclusive. For example, how should we treat the biotic pyramid that describes the movement of life from the soil and the microorganisms therein through vegetation, through herbivores and to the carnivores and primates. The value contained in a pyramid is correlated with the richness of the base, the number of levels, the diversity of the forms and the complexity of the living forms at the top. The biotic pyramid does have intrinsic value and this pyramid, the web of the interconnectedness deserves to be treated as intrinsic value in-itself and for itself.

The overriding necessity is to develop a new global ethics, the one that seeks to preserve and enhance the integrity of planetary ecosystems and processes in ecosphere and equity, social justice, and human prosperity in sociosphere (social sphere). This requires a shift from the prevailing paradigm of egocentric anthropocentrism to a new paradigm of development that adopts the holistic approach embedded in System Theory, Gaia Hypothesis and Buddha's Eco-Dharma principle (dependent co-origination) that recognize interdependence and interconnectedness as the existential foundation of social and ecosystemic well-being of the living system on planet Earth. The development paradigm with ethical system that recognizes the intrinsic and instrumental values of the diverse life-forms, the web of interconnectedness and self-organizing complexity in nature and affirms that humanity must live within the means of the planet Earth to ensure perpetuation of all species including Homo sapiens is the paradigm of the emancipation of humanity from its current egocentric anthropocentrism. I would like to call this paradigm as "Ecosociocentrism: The Earth First Paradigm", which seeks to protect and maintain the web of interconnectedness, interdependence, self-organizing complexity and enables the actualization of human potential in sociosphere and the potential of diverse life forms (biodiversity) and ecosystems in ecosphere.

The term ecosociocentrism has been derived from blending two rather contrasting terms, ecocentrism and sociocentrism. The fundamental assumption of the proposed paradigm (ecosociocentrism) is that we are materially, spiritually, and inseparably interconnected to the rest of the nature (the cosmos). This understanding helps us to recognize the instrumental and intrinsic values in nature and conceptualize the justification for both conservation and preservation. The current mechanistic and egocentric worldview does not recognize such interconnectedness with nature. The ecosociocentric worldview recognizes the fact that we must act judiciously to restore our ruptured relationships with planet Earth and reinvigorate biospheric ecosystem processes. Ecosociocentrism embodies the moral insight that recognizes the intrinsic values of other life forms in nature and that we are a part of nature, and all living beings are our fellow creatures in creation. The proposed paradigm "ecosociocentrism" postulates that human actions that protect the self-organizing property of life, resilience, diversity, interconnectedness, and the functional integrity of the planetary ecosystem is right and morally wrong, if they do otherwise.

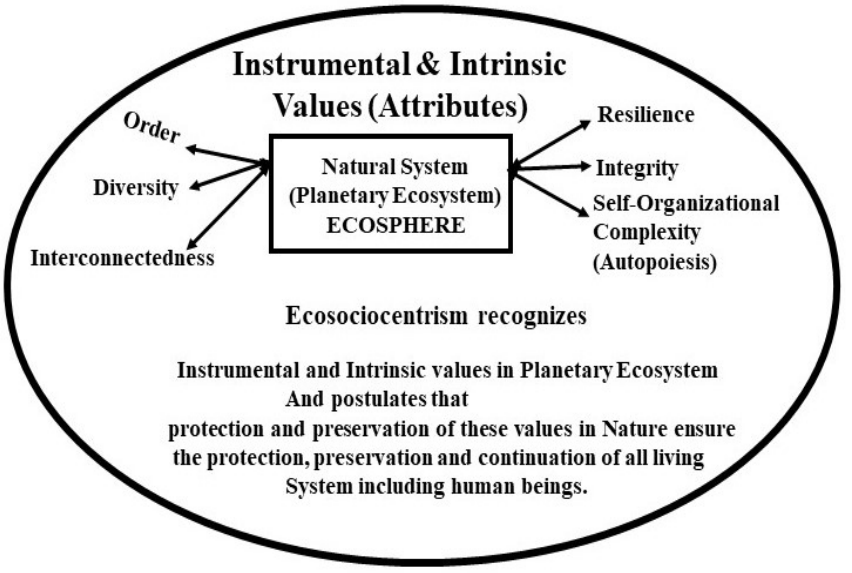

Fig. 1. Conceptualization of Instrumental and Intrinsic Values in Nature

Ecosociocentrism embraces the core principles that sustain living systems coexisting stably in planetary ecosystem. It draws insights and the understanding from how ecosystems self-organize and function in nature that can offer a model for how human could organize society in ways that could enable sustainable living. In nature, organisms develop multiple symbiotic relationships in which each organism takes and gives reciprocally. In a proper functioning ecosystem, organisms thrive by optimizing their own existence within the network of relationship that promotes conditions for their common good. The resilience created by the dynamic interactions can maintain the integrity of the ecosystems for many thousands and even million years. Human social ecology must embrace the principles of ecosystem health and the interconnectedness that sustain all living systems.

3.1 Conceptual Framework of Ecosociocentrism

The conceptual framework of ecosociocentrism as depicted in fig.2 stipulates that human social and economic system must remain within the regenerative capacity (biocapacity) of the ecosphere for sustainable future of humanity and the perpetuation of living system. Since integrity and sustainability of human social and economic system (sociosphere) is interconnected and dependent upon the integrity and sustainability of planetary ecosystem (ecosphere), resource extraction, production, processing, consumption, and waste throughput must remain within regenerative capacity of the Planet Earth to realize sustainable development, intergenerational equity, and flourishing of all living entities in Nature. The conceptual framework stipulates that sustainable development is inconceivable when the rate of resource extraction, consumption, and waste throughput production from sociosphere exceeds the regenerative and assimilative capacity of ecosphere or biosphere. Sociosphere (human social and economic system) is the sub-system of the ecosphere, and the nature of their interaction is dialectical manifested not in linear rather in cyclical progression propelled and maintained by positive and negative feedback mechanisms.

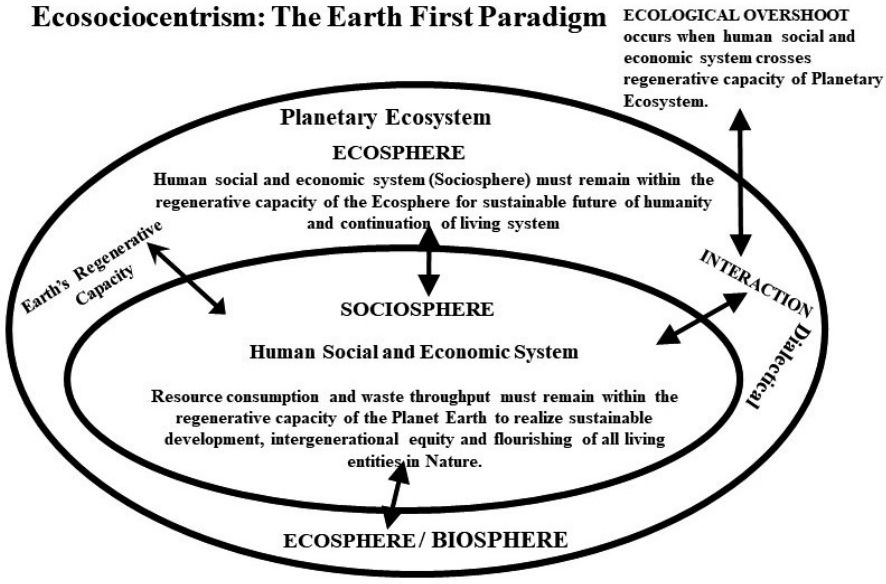

Fig. 2. Conceptual Framework of Ecosociocentrism: The Earth First Paradigm

Ecosociocentrism holds that the autonomous self-organizing property of life, diversity, resilience, interconnectedness, and coevolution are the intrinsic properties of the planetary ecosystem which have values in themselves and must be allowed to flourish, both in ecosphere and sociosphere. This paradigm states that human actions that promote social and ecosystemic health, resilience and diversity are morally right and just and human actions that degrade social and ecosystem health, resilience, and diversity are morally wrong and unjust. The ecosociocentric paradigm demands that anthropogenic activities must be reconciled with social and ecological integrity for flourishing and fulfilment of both human and biotic community. The nine principles presented below provide the foundational basis and embody the developmental and ethical imperatives of Ecosociocentrism.

3.2 Principles of Ecosociocentrism

Based on scientific and epistemological studies, discoveries, innovation and understanding of human social-cultural and physical and natural evolutionary processes, ecosociocentrism has conceptualized the following nine principles. These principles provide the rational basis for accomplishing environmental sustainability, sustainable human development, intergenerational equity, flourishing and actualization of all living system (entities) in Nature. These principles presuppose and form the basis for developing a pragmatic environmental and development ethics that can guide human behavior to live sustainably in good stewardship of Planet Earth and herald a new era of ecocivilization:

1. Human social and economic system (sociosphere) is a sub-system of the larger biophysical system (ecosphere) or the planetary ecosystem and cannot exist independently. Sustainability of human social and economic system is invariably interconnected with and dependent upon the integrity and sustainability of biophysical system or the ecosphere.

2. Sustainable development is inconceivable when the rate of resource extraction, consumption and throughput production from human social and economic system exceeds the regenerative and assimilative capacity or the biocapacity of the biophysical system (ecosphere). Human socio-economic sub-system must operate within the regenerative capacity of the ecosphere or biophysical system of the Planet Earth.

3. The nature of the interaction between sociosphere (human social-economic system) and the ecosphere is dialectical both causing changes in each other which gives rise to a new relational state or equilibrium that may be less or neutral or more detrimental to the well-being of human beings and other life forms in nature.

4. Human rationality, intellect and wisdom can change the trajectory of the environmental crisis and detrimental changes (global warming, climate change and destruction of planetary ecosystem) and its consequences towards environmental and social sustainability in which actualization of human potential and flourishing of other life forms is possible.

5. Human caused destruction and degradation of planetary ecosystem that generates life sustaining environmental goods and services undermines the security and survival of all life forms including human beings. Humanity cannot survive by destroying its own niche, the Planet Earth. Save Earth First to save humanity and rest of the biotic community.

6. The life sustaining environmental services and interconnectedness, self-organizing complexity on which depend the very existence of human beings and other life forms in nature must be considered to have both instrumental and intrinsic values.

7. Protection and preservation of biological diversity, ecosystem resilience and the web of interconnectedness, self-organizing complexity of life and life sustaining environmental services provide the fundamental basis for building social and environmental sustainability.

8. Humanity's development endeavor and behavioral conducts must be guided with a prag-

matic environmental and development ethics that embodies both instrumental and intrinsic values in nature and cultivates and nurtures humanity to live sustainably within the means of the Planet Earth.

9. Ecosociocentrism (the Earth First Paradigm) states that humanity's actions that protect the integrity, resilience and the functioning of the planetary ecosystem are right and just, and morally wrong, if they do otherwise.

4. CONCLUSION

Certain attributes or properties of natural system that evolved through million years of evolutionary processes can be considered to have intrinsic values. These attributes namely, self-organizational complexity (autopoiesis), resilience, diversity, and interconnectedness can be considered to have both instrumental and intrinsic values. It is inconceivable to sustain the existence of humankind and the living system without recognizing and protecting these values in natural system. A development ethics that recognizes these values in planetary ecosystem and guide anthropogenic actions and behavior to live within the planetary means is necessary. Such development ethics must treat these values as both instrumental and intrinsic and seek to preserve and enhance the integrity of planetary ecosystems and processes in ecosphere and equity, social justice, and human prosperity in sociosphere (social sphere). This calls for a shift from the prevailing hyper-anthropocentric paradigm to a new paradigm of development that adopts the holistic approach embedded in System Theory, Gaia Hypothesis and Buddha's Eco-Dharma principle (dependent co-origination) that recognize interdependence and interconnectedness, diversity, and organizational complexity (autopoiesis) as the existential foundation of social and ecosystemic well-being of the living system on planet Earth. This paradigm can appropriately be called as "Ecosociocentrism: The Earth First Paradigm". Ecosociocentrism postulates that the autonomous self-organizing property of life, diversity, resilience, interconnectedness, and coevolution are the intrinsic properties of the planetary ecosystem and have values in themselves and, therefore, must be allowed to flourish, both in ecosphere and sociosphere.

The Earth First Paradigm regards human actions that promote social and ecosystemic health, resilience and diversity as morally right and just and human actions that degrade social and ecosystem health, resilience, and diversity as morally wrong and unjust. The nine principles embodied by this paradigm provide the foundational basis for developmental and ethical imperatives of Ecosociocentrism. They provide the rational basis for accomplishing environmental sustainability, sustainable development, intergenerational equity, flourishing and actualization of other living system (entities) in Nature. These principles provide the basis for integrating pragmatic environmental and development ethics that can guide human behavior to live sustainably in good stewardship of Planet Earth.

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