SUSTAINABLE DEVELOPMENT: DIVERGENCES AND COMPLEXITIES IN INTERPRETATION

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ABSTRACT: Unprecedented complexities in confronting economy, society and environment in addition to myriad of systematic dysfunctions resulted in UN sponsored World Commission of Environmental Development (WCED) led by former Norwegian Prime Minister Brundtland in 1987. Its report; *Our Common Future*; is a well known mile stone in history of eco-friendly thinking since it has a significant effect on sources exploitation, decision making and governance while reinvigorates local and ethnical approaches. Shedding light on future of human and his life on the earth, implications of WCED was legitimating through extensive initiatives taken after 1987 successively. To enhance and develop the WCED achievements, series of them ensued then namely Rio declaration (1992), agenda 21 which followed by local agenda 21 and Habitat (1996). These initiatives were launched to implement diverse facets of sustainability while mostly relied on the definition delivered by Brundtland. Despite of widespread concurrence with that definition, a large number of scholars challenge comprehensiveness of definition and strive to fill its gaps to prevent misleading and ill interpretation. Even several go further and propose definitions based on holism and sophistication.

This paper reviews sustainable development concepts and definitions in historical and contemporary context. It discusses on flaws of Brundtland definition and delves into remedial attempts to tackle the issue.

Keywords: sustainable development, precursors' and contemporaries' definitions, Brundtland report, epistemological and normative approaches, and UN initiatives.

1. INTRODUCTION

'Sustainable Development' is part of our common lives every day utilised more and more by people (Loomis, 2000) in different ways (Kelly, 1998). Our flourishing approaches to utilize the term have resulted in wide spectrum of definitions and interpretations based on what we perceive by it. These assumptions directly affect decision making, political legislation, governing and even implementing its results. It is of great importance since globe is overloaded by issues such as fragile economic growth, social catastrophes and environmental hazards, all associated with uncertainty in entire aspects of life. 'Sustainable Development' definition, however, does not a concrete answer to all afore mentioned apprehensions, but may shed light on our methods coping with periphery. Notwithstanding divergences, the term was legally introduced in WCED, 1987, but can be studied via diverse stances that profoundly provide a basis to understand gist of the term and hinders ill conceiving. Therefore, WCED as a mile stone stands in the middle of the term history while all related events and discussions encircle it.

2. HISTORICAL BACKGROUNDS

Due to the main ambition of sustainable development to embody holistic views of objectives, study on historical backgrounds of it cannot simply lies on a single view but through diverse angles.

2.1. Economy drivers:

In contemporary era, Rostow's *the stage of economic Growth* (Rostow, 1971) and Kuznet's *Modern Economic Growth* (Kuznet, 1966) are among of economist who discussed about economy and development while Malthus the first precursor who pointed out that growth rate is limited as a reason of resources scarcity (Oser, 1975). He showed that with passing time and exploitation of resources due to increase of population, limitation will hinder growth.

Today, two school of thought argues the sustainable economic development via environmental thinking, first strongly insists on maintain and conservation of existing natural source and second one in contrast with the first, draws on the issue with dependency on "long-term non-declining per capita utility" (Bithas, 2008).

2.2.   Social beliefs:

Beliefs in historical context can be classified under religious credence. Religion plays a crucial role in our learning, while its teaching determines barriers of our behaviour in deal with our surroundings. How our particular beliefs affect our environs is discussed in the book '*This Sacred Earth*' (Gottlieb, 1996). He concludes that religion has a dual effect on environment which cannot be simplified as an agent of environmental degradation or unmixed repositories, but has been both simultaneously. For instance, old Hawaiian believed that entire world is living in the same as human and so there was close parallel with them (Dudley, 1996) while old Africans saw the world infinite without limits and both visible and invisible in form of major and minor rhythms which man is in centre of that but still the friend and beneficiary (Mbiti, 1996).

Definitely, constructing today's notions on basis of this tenets if is not wrong, at least is not sufficient because of emerging new issues in

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environment and economy which is explicitly the result of advanced technology. Nevertheless, the most addressable precept of those religions is compatibility in idea of living in harmony with the nature as the one of fundamentals in concept of sustainable development. In modern time, however, severe forms of sustainability concept do not allow substitution of resources as emphasized in 1972 by A. Naess, a Norwegian philosopher, who was believed in minimizing of consumption (Weddell, 2002) (Naess, 2005), although softer approaches allows compensation of resources by another (Barbier, 1987). These views are fitted in school of thoughts which is come in very previous section.

2.3. Political perspectives:

Sustainable development includes multitudes of people from employees to employers and from civil servants to politicians (Priemus, 1999). According to Vionov (Voinov, 2008), sustainability is now a more political issue that a scientific concept. Taking into account that accentuation of term 'sustainable development' is a development rather than sustainability; which should be amended to 'developing sustainability' (M.M'Gonigle, 2003) that means to establish an institution shift from economy to ethnic (Robertson, 2001) because the point of economic transaction of business is usefulness for improvement not sustainability (Andrew H.T. Fergus, 2005); in some extents this concept is a new instrument for Western countries to how best modernise the former colonies (Cecile M. Bensimon, 2006). This is the reason that Roszak (T.Roszak, 1989) admires Schumacher who refutes advanced technologies that give a rise to depletion of sources and taken place far away of human spirit and hence, eventually cause to failure of such economic uncaring of non-economic factors in process of decision making (Schumacher, 1989). Therefore, immediate precursor to concept of sustainable development is appropriate technology and pressing social needs (Mebratu, 1998) without just stressing on growth and not emulating the Western economy as the best model.

3. IDEOLOGICAL CONTEXT

Via other perspective, worldviews informing development can be debates as mechanistic and systematic worldviews based on North/West philosophical heritage and South/East philosophical heritage respectively (Plessis, 2000):

3.1. Mechanistic worldview:

Drawing on doctrine of Rationalism and Empiricism, the view sees the world and human separately but still human is part of it but the world serves to human. World is as a machine, while human position is above the nature in terms of ecology. So he can rule it and has right to exploit it.

3.2. Systematic worldview:

Drawing on ideas of holism and communalism, the view sees the world and human together. World as an organism consists of subsystems within subsystems, which in addition with humankind is greater than sum of its part. So he is part of that without power of ruling, however he can influence it, but also he maybe being influenced by it.

3.3. Comparison between worldview:

Mechanistic and systematic worldviews have differences which major of them are shown in table1. These differences can be observed via different lenses:

Table1. Differences between mechanistic and systematic worldviews based on Plessis.

	Mechanistic	Systematic
Heir	North/West philosophy	South/East philosophy
Doctrine/ Idea	Rationalism and Empiricism	holism and communalism
Tools	Observation, measurement and rational analysis	Intuition, participation and adaptability
Framework	Linear casual	Cyclical casual
World	As a machine	Organism
Human	Separated as a ruler and above	Involved as a part and within

Sociology	Individual good	Communal good
Ecological term	Anthropocentric	Eco-centric
Paramount objective	Fittest individual survives	Community survives
Social status based on	Individual success	Group success
Orientation	Goal- oriented	Process-oriented
Development perspective	Increasing growth	Continuous improvement
Emphasis on	Quantities and formula	Quality and pattern

Mechanistic views result in questions such as 'how much/how long we can use' and 'how we should measure it' whilst in systematic views one may confront with instructions such as 'as little/long as possible' and 'continually' (Plessis, 2000).

In conjunction with above theories, three other tenets are distinguished (Pepper, 1993):

a. Eco-feminism: referring to feminism movement, its theoretical positions rest on assumption of correlation between nature-women domination.

b. Eco-socialism: a manifestation of ecologically crisis as inherent crisis of capitalist system which can be overcome by ecologically oriented socialist development.

c. Eco-theology: based on mankind ignorant of wealth within ecologically material in religious traditions.

Other studies are tended to see the term via two so-called paradigms: strong sustainability and weak sustainability (Neumayer, Global Warming: Discounting is not the Issue, but Sustainabiity is, 1999):

Weak sustainability: in weak sustainability preservation of value of total aggregate stock of capital is necessary.

Strong sustainability: is preservation of natural capital stock itself (Neumayer, Weak Versus Strong Sustainability, 1999).

4. GLOBE CONCERNS BEFORE WCED

Use of word 'sustainable' can be traced to at least 600 years ago which was in relation with nature and sustainable life, in conjunction with some wonderful

landscapes in Shiraz and Esphahan; in Iran; demonstrate a "deep-rooted feeling linkage between surrounding Nature and Muslims" (Jefferson, 2006). The term's concept, also, can contemporarily back to 60's and 70's when a conscious group of citizens congregated in a club which later known as Club of Rome, discussed global environmental crisis and published the results in a book known as "Limits to Growth" (Donella H. Meadows, 1972). International attention emerged as a result of UN (United Nations) attempts in 1972 by UN Conference on the Human Environment while the corner stone laid by World Conservation Strategy (1980) of the International Union for Conservation of Nature and Natural Resources (IUCN). The term 'sustainable development' did not appear in the text of IUCN but according to Khosla, concept of sustainability was certainly highlighted with strategy's subtitle of IUCN, "Living resource Conservation for Sustainable Development" which was working closely with UNEP (United Nation Environment Programme) (Khosla, 1995).

Reviewing the literature of sustainable development and influence of WCED, Riggs found 72 definitions for development which are replaced for former term including 'progress' and 'evolution' (Riggs, 1984).

5. WCED LAND MARK

In 1987, World Commission of Environment and Development report, *Our Common Future,* established the term 'sustainable development' in public minds via stressing on strong relation between economic development and sustainable environment now and future. It was led by former Norwegian Prime Minister Gro Brundtland, hence the report is well celebrated as Brundtland report. The report defines the term as:

"*meet the needs of the present without compromising the ability of future generations to meet their own needs*" (WCED, 1987).

This definition is the most well-known definition of sustaibale development amid institions and people (Mauerhofer, 2008). Newman argue that the definition is purposefully set with ambiguty till provokes others to work on its concept, a manipulating leading toward profoundly understanding of concept (Newman, 2006).

6. VERY POST WCED INITIATIVE

After *Our Common Future* in 1987, United Nation inaugurated several initiatives in line with goals and concerns of WCED including conferences and publications in world-scale. But the best known of them was Rio declare which has a major effect on popularization of term sustainable development among people of world (Meg Holden, 2008).

In 1992, Earth summit was a climax of UN process to introduce the achievements of WCED to all its members, which even was even unprecedented in both size and scope of concerns with theme of environment and sustainable development and 172 participants, 108 head of state or government (Earth Summit, 1997). It immensely evolves world leaders' attention to importance and legislation of sustainable development (Barber, 2005). It leads sustainable development in global agenda (Annan, 2002).

7. DEFINITIONS

Almost of all scholars are agreed on the point that there is not precise definition on sustainable development (Alexey Voinov, 2007) however yet, the Brundtland definition is commonly concurred as not an acceptance but general agreement on concept . The vagueness of definition perhaps was a "good political strategy" in 1987 but since then, "no longer a basis for consensus, but a breeding ground for disagreement" (Daly, 1996). The problem with a largely undefined term is that however may pin his/her definition to the term and "win a large political battle for future' (Mebratu, 1998), and the term as a cliché like a "plastic word" can means anything that may results of people agreement upon nothing (Mitcham, 1995). Furthermore, it prompts dichotomy between intellectuals, whereas some argued that it cannot be precisely defined (Prezzy, 1989) (D.W. Pearce, 1993) (Costanza, 1991) in contrast of those who still endeavour to adequately define it inter alia:

Costanza's and Patten's definition lies on basic idea of sustainability: 'a sustainable system in one which survives or persists' and add: "A system is sustainable if and only if it persists in nominal behaviour states as long as or longer than its expected natural longevity or existence time; and neither component- nor system-level sustainability as assessed by the longevity criterion, confers sustainability to the other level" (Robert Costanza, 1995).

Without striating forward definition, Graaf et.al. merge two definitions one formal but not operational and the other procedural but not with guarantee for sustainability: "sustainable development is a development of a socio-environmental system with a high potential for continuity" because it is kept within economic, social, cultural, ecological and physical constrains" (H.J. de Graaf, 1996).

Mestrum with emphasising on that which sustainability needs a broader meaning, discloses employing the term by some international institution, particularly World Bank, may cause ambiguity and agitation in situation, even if they are totally agree with the Brundtland report as official accepted definition (Mestrum, 2003).

Scott's definition comes with: "sustainable development improves lifestyles- by bringing cultural and economic growth embedded within environmental gentility- without jeopardizing the ability of future generation to live even better (Scott, 2004)".

8. INTERPRETATIONS

Once somebody attempts to adequately define the term 'sustainable development', definitely will confront lots of inherent problems with the matter of comprehensiveness. So approaches vary due to the stance of definer because in some extents it carries different meaning for different people (Guler Aras, 2008). *World Conservation Strategy* (section1, paragraph 3) defines development as "modification of biosphere and the application of human, financial, living and non-living resources to satisfy human needs and to improve the quality of human life" (World Conservation Strategy: Living Resource Conservation of nature and Natural Development, 1980) which implicitly stresses on pattern of consumption which profoundly affect resources and energy profile of economy growth (Frans Berkhout, 2008). Concept of sustainability among the scholars is even more controversial. Purists' believe is adhered to nothing than stasis and often imply development in a sustainable manner (Stuart L. Hart, 2003), while Guler and Crowther (Guler Aras, 2008) argues that development is neither a necessary nor desirable aspect of sustainability.

In both ways of theoretical and practical components, a greater description and discrimination would not solve the conceptual ambiguity of 'sustainable development' because of heterogeneity of the perceptions of reality based on fallacious dilemma of two opposed though systems (L.A.R.Osorio, 2005)

9. OUTCOME

Divergences and complexities in interpretation of term 'Sustainable Development' is debated. Study indicates that despite of lately introducing the term in 1987, the term benefits a history as long as human's history and has been considered as an incessant concern along his maturity within either facet of the life and advancement. 'Sustainable Development' has not been precisely addressed until 1987 but has been acknowledged in some degrees, particularly in those areas or times that he was more dependent to nature or certain types of sources like water or land. Due to its points of view in his surrounding and level of his discernment about himself, his insight and perception regarding the term has been changed. By passing time and attaining more sophisticated cognition on phenomena's reason, he initiated manipulating the nature for more and better exploitation which in parallel led to developing concerns in same contexts regarding the sustainability by evolving from moralities into physical matters. Anxiety of 'Sustainable Development' always has been composed of minority and micro-organism with a holistic view to majority and macro-organism; hence its definition must encompass all these and denotes its integrations otherwise it fails in its mission. Delivering a single definition for 'Sustainable Development' is a vain attempt since the term has been made up of concept of diversity and its comprehensiveness would be a pose for questions raised. Human experience to cope with such problems in terms of definitions signifies that the apt solution is adopting notions and accepting it as a principle or fundamental concept. For instance, one may refer to the history of geometry as one of the old branches of knowledge, which instead of endeavouring to define 'point'; it was accepted as a fundamental.

Furthermore, the Brundtland definition should deem just as a concept for main idea of 'Sustainable Development' with no more effort to define it again, however a true and inclusive understanding of the term necessitates

literatures in history, conceptions, notions and viewpoints which shape interpretations.

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[1] World Health Organization

[1] Good Manufacturing Practices

[1] In treatment productions complex, that part including the virus and bacteria vaccines, treatment serums, and antigens are called the biologic productions for the type of production. In the production of such products, alive and half- alive viruses and bacteria are used in the preliminary stages and up to the end of the production process sometimes.

[1] Bio Safety Level

[1] critical zone, may include the distinguished air class or the fully sterilized conditions. Temperature, light, humidity, and other environmental factors should be at a determined and defined level. Obviously, the input and output method of materials, personnel and equipment has weal models. In addition, other physical and structural factors such as the final materials, doors, and windows should have correct specifications.

[1] Reference: Zareh Shahneh, Abolghasem (2006), "Designing the Cleaning Room", 1st Edition, Tehran, Farhange Eslami Press.

[1] The transferable pollutions include the contaminations caused by the humankind, air and material contamination. The human factor is a main source for pollution. Particles are excluded from the mouth and nose of people and yet the physical movements of the humankind general particles. The more is such movements the higher will be the generated particles. If the air is not cooled, it will carry the contaminated particles with itself. The next contamination factor is the consumed materials in laboratories. In case of contamination the origin of which is the space itself, we may introduce the laboratory equipment and tools. In this kind of spaces, we should avoid creation of surfaces, because surfaces absorb contaminations.

[1] Air Lock Room is a space that functions as a device for establishing relation between the spaces with different classes or different air quality and is designed for this purpose.

[1] For instance, this matter may have impact on the selection of the sticking and air lock materials of the final work or materials used for sitting and air tightening the air filters.

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