

Sustainable Development, Human Needs, Well-Being and Energy

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Abstract – Sustainable development can be seen as the harmony between two forces composed in one part by the different biophysical systems of the planet and in the other by the development seen as economic growth. Latouche presents this harmony in a clear way when it says that it is an "economically efficient, ecologically sustainable, socially equitable, democratically founded, geopolitically acceptable, culturally diversified" development (Latouche, 2007. cited by Gomez, 2014) and the which can be derived some elements or dimensions that are in constant interaction and that make this development problem and its sustainability should be approached from a broader perspective than only the environmental one, implies an approach from the human, the social, the political, the institutional and the economic.

In this approach, there are two key elements to take into account: Human needs and energy. The first because of the satisfaction of these is where the well-being part and this is the element considered as sustainable for humanity and the planet. The second, because there is a close relationship between human needs, well-being and economic growth of a society, since energy is the main satisfactory of human needs.

Keywords – Sustainable Development, Well-Being, Energy Efficiency.

I. INTRODUCTION

This document makes an approach, from the bibliographic review, of the role of energy in sustainable development. For this, the document is divided into four (4) sections that seek to present in a concise manner each of its elements, within the framework of energy and sustainable development from the perspective of human needs and the well-being of society.

In the first part, what is related to sustainable development is presented as a framework for the content of the document. In a second section, human needs and development are treated as the basis for energy consumption. Subsequently, in the third chapter, energy is addressed and its relationship with human development, energy as satisfying human needs. In the fourth chapter, education for sustainable development and sustainable energy development is shown, as a strategy to achieve energy efficiency and responsible consumption.

Finally, the document presents conclusions on the approach of the different topics presented.

II. SUSTAINABLE DEVELOPMENT (DS)

Sustainable development has become an important part of national and international considerations by integrating the economic, environmental, social and ethical aspects so that the current and future generations can enjoy a quality of life for as long as possible [1].

Sustainable development had its beginnings, mainly from the perspective of protecting the environment to maintain the progress and development of human society. The terms "Development" and "Sustainability" began to be used as part of the same sentence, as a result of a study commissioned by the Club of Rome to the MIT (Massachusetts Institute of Technology) in 1970 and which was known as the Meadows report. And published under the title *The Limits to Growth* [2]. This study is where, for the first time, the idea of a limit to the growth and consumption of the planet's resources is presented, since they are presented as finite and this is done under the premise that sustained economic growth on a finite planet it would lead us to collapse and that to avoid this it is necessary to put limits on demographic growth, industrialization and the exploitation of "natural resources" [3].

Already in the World Conservation Strategy of the International Union for the Conservation of Nature, published in 1980, the concept of sustainable development and global dependence on nature and development was highlighted. Sustainable development was defined as the modification of the biosphere and the use of living and non-living financial human resources to improve the needs and quality of life of human beings, taking into account social, ecological and economic factors [4].

Subsequently, in 1983, the World Commission on Environment and Development was created, which published in 1987 the Brundtland report also known as "Our Common Future", in which the term "Sustainable Development" is used for the first time. "And this is defined as one that" meets the needs of the present without compromising the ability of future generations to meet their own needs" [5]. This definition includes the demand of contemporary and future generations, natural resources, ecological carrying capacity, the combination of environment and development. In this context, "Sustainable Development" consists of a scheme of human, social and economic development that is capable of remaining indefinitely in harmony with the biophysical systems of the planet [6].

Durán et al. (2015), present three (3) key components of sustainable development, identifying them as the economic component, the ecological component and the human component. The first component refers to economic development seen as the maximization of income flow in consideration of the rational and efficient use of resources, particularly the scarce resource. It makes the clarity, fundamental, that "from the perspective of sustainable development, economic growth must be such that the negative environmental impact is limited." Despite this,

development must be conceived as a multidimensional process, involving fundamental changes in social structures, in institutions, aiming at accelerated economic growth, reducing inequality and eradicating poverty [7].

Regarding the ecological component, it can be defined as the ability to sustain the three basic functions of the Environment: the power function of resources, the function of the receiver of waste and direct utility [7]. Because of its complexity, the ecological component of sustainable development captures not only real economic development in relation to the environment, but all development.

In other hand, the human sustainability component takes into account social interactions, the relationships between individuals and their environment, behavior patterns and individual and collective values. Minica and France (2008), synthesize the human aspect of sustainable development worldwide involving the following objectives: Promotion of education, training and public support for the environment; Protection and promotion of human health (focused on access to medical services, especially in rural areas, control of infectious diseases, risks of pollution and ecological risk). Fight against poverty (through access of the poor to sustainable livelihoods, promotion of human development and integrated investment in human capital policies). And Sustainable threatening demographic development (focused on population growth, especially in developing countries) [7].

This is how sustainable development can be seen as the harmony between two forces composed in one part by the different biophysical systems of the planet and in the other by development seen as economic growth. Latouche (cited by Gomez, 2015) presents this harmony in a clear way when it says that it is an "economically efficient, ecologically sustainable, socially equitable, democratically founded, geopolitically acceptable, culturally diversified" development [5] and the which can be derived some elements or dimensions that are in constant interaction and that make this development problem and its sustainability should be approached from a broader perspective than only the environmental one, implies an approach from the human, the social, the political, the institutional and the economic, as structural edges of a polyhedron.

III. THE HUMAN BEING, THE SATISFACTION OF YOUR NEEDS AND WELL-BEING

Cantu (2010) says "The environmental crisis, at present, is strongly associated with lifestyles, the prevailing social structure and behavior in our society, rather than the intricate and complex situations raised in nature" [8].

The central idea of the theory of human need is there is a finite number of needs that are self-evident (that is, universal, recognizable by any person), incommensurable (thus, satiable, irreducible and not substitutable) and non-hierarchical, that encompass the range of capabilities or dimensions of well-being. These needs are prerequisites for living well within society: only when they are satisfied can well-being be achieved [9].

The satisfaction of the needs of the human being leads to what is known as well-being, which has been studied and

defined by various authors throughout the history of humanity itself. Likewise, the different economic models that humanity has implemented, associate well-being with economic growth and these in turn with happiness. This meaningless association based on the intensive consumption of resources that can quickly become wealth and transitivity in well-being and happiness, has led to predatory behaviors that see their effects in social, human, territorial and environmental conflicts, fundamentally.

For the mention of the way in which individuals see the well-being and the satisfaction of their needs, the two (2) most well-known schools of thought around this concept will be taken as a base: the Hedonic School and the Eudaimónica School.

The hedonic school of thought sees well-being primarily as the maximization of pleasure (and minimizing pain) (Dolan et al., 2006, Thompson and Marks, 2008). In contrast, the eudaimonic school of thought sees well-being as the ability of humans to reach their maximum potential within the context of their society. It is fair to say that the hedonic school is dominant in multiple scenarios and spheres [9].

The hedonic understanding of well-being became dominant in social philosophy and economics with the development of the concept of utility by Jeremy Bentham in the eighteenth century: "utility is the property of any object that tends to produce happiness or reduce suffering or unhappiness" (Beckerman, 2011, p 83 cited by Brand-Correa et al., 2017) [9]. As the modern economy was developed based on consumption and the generation of capital, a utility model was created and massified based on potentially infinite and insatiable individual desires. Therefore, the maximization of utility was very strongly associated with the satisfaction of the needs of the individual. Pigou (1932) points out "everyone prefers present pleasures or satisfactions of magnitude given to future pleasures or satisfactions of equal magnitude, even when the latter are perfectly sure of happening" [10].

As it is understood, hedonism has clear consequences for sustainability: any limitation for levels of consumption or generation of capital can be immediately perceived as limits to well-being. Likewise, in a hedonic world, intergenerational factors cannot be considered when assessing well-being, since it is a static assessment of the particular experience (s) of an individual. This is especially relevant for environmental and climatic considerations, in which current actions inevitably have future impacts (O'Neill, 2008b cited by Brand-Correa et al., 2017)[9].

In contrast, eudaimonic well-being focuses on the individual in the broader context of their society. Therefore, a eudaimonic understanding of well-being is more appropriate to address sustainability issues. A similar argument can be made about the importance of intergenerational responsibilities in long-term environmental sustainability. An eudaimonic vision of well-being allows the inclusion in the analysis of a sense of social belonging to our community both in the past and in the future, thus opening the space for intergenerational citizenship through the exchange of projects and common places (OR 'Neill, 2008b cited by Brand-Correa et al.,

2017)[9].

From the identification of human needs and the way in which well-being is approached, the distinction is made between the means used to satisfy the needs, or "Satisfactors", which are the key to sustainability. This is how the needs of a society immersed in a territory may not be the most important for other social conglomerates, which increases the gaps between the opportunities for some populations to advance in this framework of sustainability, leaving the invisibility those manifest needs, usually represented by minority and vulnerable groups. That is, sustainable development may not reach all nations equally [8].

IV. ENERGY AND HUMAN DEVELOPMENT

Energy has always been related to human, social, industrial and economic development. At the most basic level, energy is required to cook our food, warm the cold and turn on light in the dark. Without meeting these needs, survival is directly at risk. By going beyond survival, energy becomes an essential component of every aspect of development [11].

As Warr (2010) says, energy is essential for any form of economic activity, the increase in energy consumption along with technology, have characterized the industrialization and the processes of economic development during the last century [12].

Some authors already recognize that energy systems are a central component of societies (Ayres and Warr, 2009, Cook, 1971, Cottrell, 1955, Smil, 2008, White, 1943) and necessary for development [9]. The relationship between energy and development has also been recognized by the United Nations (UN) by including access to it in the Sustainable Development Goals (UN, 2016) and in the Sustainable Energy for All initiative (UN SE4ALL, 2014).

Although developed countries are beginning to separate their energy consumption from economic growth (through structural changes - shifting the production structure from energy-intensive industries to less energy-intensive service activities and increases in energy efficiency), there is still a strong direct relationship between energy consumption and economic development in developing countries [12].

To the extent that the satisfaction of human needs and well-being are tied to energy, understanding the relationship between energy consumption and economic and social growth becomes fundamental. According to Ouedraogo (2013) and based on the recorded data on energy consumption, this has been growing exponentially. This growth is partially attributable to the needs of an exponentially growing population, but is also partially attributable to the energy demands of increasingly industrialized, urbanized and mobile societies [12].

Energy is not only a strategic national resource, but also an important base for the social and economic development of a country. The last decades have witnessed the scarcity of coal, oil and other fossil fuels, along with environmental problems caused by the use of fossil energy, which have seriously hampered global development. Many countries have considered the development of new energies as a

primary method to solve the energy crisis and as an important development strategy [13]. The discussion based on the sustainability of energy takes two (2) paths: the first marked by the source of energy and its ability to emit pollutants into the biosphere. The second one is focused on its use and is known as energy efficiency.

Solar energy and some types of alternative energy are the only ones considered as infinite, or at least with a capacity of generation and permanence that extends over time so that this and the next generations would not have to worry about its depletion, they become the only satisfiers of human and social needs that would guarantee the continuous well-being of society with a special additive, the environmental pollution caused in their generation is minimal and therefore is considered environmentally sustainable.

On the other hand, those energies that are considered finite, that is to say, those which, if their current consumption rate is maintained, would exhibit depletion in the short or medium term, have the particularity of being the most used at this time and having high levels of pollution. Environmental by generation, transformation and use that make these are considered as environmentally NOT sustainable.

Several authors have conceptualized energy efficiency as a strategy for sustainability (Macía, 2003, Poveda, 2005, Díaz, 2006, Abdallah, 2013, Rajbhandary, 2017), but always making it clear that this excludes any action that implies reduction in generation of energy or in the territory's GDP, as an indicator of economic growth. But extracting the common elements of the various definitions, energy efficiency can be defined as a set of activities that allow obtaining a good or service with less energy, less energy losses and less pollution, without sacrificing the well-being of the population.

Energy efficiency is commonly seen as a key option for mitigating climate change. It has also recently been promoted as an industrial policy to boost economic competitiveness. For example, the Energy Strategy 2030 of the European Union describes energy efficiency as fundamental in the transition towards a more competitive, secure and sustainable energy system (European Commission, 2014 cited by Rajbhandari et al., 2018) [14]. And the US government has recognized energy efficiency as a key part of its strategy to support commercial competitiveness (Mulholland, 2009 cited by Rajbhandari et al., 2018) [14].

On the other hand, discussions have also addressed the way in which energy is managed and in particular energy services. On this, two great ways of managing them have been identified: The management of the supply of energy services (SSM) and the management of the demand for energy services (DSM).

SSM influences energy producers to ensure sufficient energy supply and to focus supply solutions and the contradiction of demand on the supply side. The main form of SSM is alternative energy and alternative trade. Alternative energy refers mainly to the search for alternative energy to achieve the diversification of energy use; Alternative trade is carried out mainly in two ways: the import of energy and the transfer of industries [13].

For its part, DSM employs exhaustive economic, legal, technical and other measures to regulate user behavior, improve the efficiency of energy use and reduce dependence on energy-intensive industries [13].

In the previous section, there is a tangential relationship to energy and its role in human and sustainable development. But for total clarity of the given approach, energy is taken as a vital "satisfying" of human needs and well-being, meaning that the individual and society make use of energy as a means to satisfy their needs and achieve well-being.

V. EDUCATION FOR SUSTAINABLE DEVELOPMENT AND SUSTAINABLE ENERGY DEVELOPMENT

What is Education for Sustainable Development? It is the management of knowledge in search of a construction of the harmonic development between the environmental, social, economic, institutional and urban dimensions and of future scenarios that tend to the integral improvement of the quality of life. This means that this life and community require and appropriate and internalize knowledge about sustainable development, then transmit it to other current and future members of that community and address their permanent improvement in a comprehensive way, seeing sustainable development of the community as a regular polyhedron whose edges are the dimensions and their interactions, and that this polyhedron needs to evolve, reach better and better scenarios, but in a harmonic way to avoid its deformation, loss of structure or transformation into a nonsense structure, which attempt against the "better life" of the community, its members and the environment.

What does it have to do with Society and Culture? The society and the individual, or better as Max - Neef (2010) says, Social development and individual development cannot occur in a divorced manner. Nor is it reasonable to think that one can survive mechanically as a consequence of the other. A healthy society must consider, as an unavoidable objective, the joint development of all people and of the whole person [15]. This approach is a sentence on the close link or better, the relationship of direct dependency that exists between the individual and society and is the ESD responsible for giving them the knowledge, tools and the laboratory so that both, harmoniously and integrated, achieve permanent improvement.

And where is the culture? Because culture is part of society and like the individual, cannot occur in a "divorced way." Tylor, in 1871, defined culture as "that complex whole that includes knowledge, beliefs, art, morals, law, custom and other faculties and habits acquired by man as a member of society" [16]. This concept is reinforced by Linton (1971) when he states that "there are no societies or individuals that lack culture. Every society has a culture, however simple it may be, and every human being is cultured in the sense that he or she is a carrier of one or another culture" [16]. Is in this way that it can be affirmed that Education for Sustainable Development, must base its objective of management, transmission and transfer of knowledge, in the culture of society (seen as the container

and propitiator of the relationships of individuals and the same culture that integrates them and makes them one) and of the individual himself; this being one of the edges of the polyhedron. In a few words and taking elements cited by Enrique Leff (2000) on sustainable development and applying them to ESD, it has the task of studying, managing knowledge and its transfer and rethinking the relationship between culture and nature; between the different cultural meanings and the various potentials of nature [17].

Energy education for sustainable development can be a valid way to achieve this, according to Dias et al. (2004) People first need to better understand this product, from exploitation to final use, as well as other agents present in the process, such as marketing, the availability of energy in nature, transportation and environmental impact [18].

Changing personal values through correct didactic interventions, especially through educational institutions, represents an appropriate approach to conducting energy conservation concepts. The first step in the conservation of an energy education program for sustainable development is to take into account the cultural and geographical differences of each population. This process is called "contextualization". Good examples are better accepted by people than impersonal information without connection to their reality [18].

VI. CONCLUSION

Although the relationship between energy, energy efficiency and economic development has not been sufficiently determined, it is indisputable that there is a relationship between energy and human development since it is used by man and society as a satisfactory your needs and well-being provider.

The meaning that societies give to well-being has a direct influence on the way they choose to continue to improve it, and these forms necessarily have some kind of environmental, economic consequences in the use and energy requirement.

Energy education and human development are related and require an interdisciplinary action. Understanding human behavior is not an easy task due to social, economic and educational differences. Energy education for sustainable development is a valid strategy for current generations to begin to understand the relationship between energy, society, environment and economic development in order to make efficient use without thinking about stopping economic growth or to the detriment of well-being achieved.

Energy management must be carried out from the supply (SSM) and demand (DSM) of the energy service, in a joint and complementary manner. The strategies used for energy management must contemplate their field of application on both sides of the energy service in a holistic way that is, integrating and seeing as a whole the energy system from the generation to the use of the energy service as satisfying the needs human beings and well-being provider to society.

It is fundamental that all the actions undertaken by this generation incorporate within their scope and continuity the coming generations and the future of the Earth and that they

can put into practice actions that represent social objectives.

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