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Sustainability and sustainable development: unraveling overlays and scope of their meanings

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Abstract

The sustainable, sustainability and sustainable development are remarkable and timely terms at the global level. However as they lack an axiomatic concept, they lead to criticism and doubts in their theoretical application and praxis. In this sense, this study aims to analyze the attributes of sustainable, sustainability and sustainable development to contribute to its concept. This work is typified as a qualitative, bibliographical, and interpretive one, in which the databases of consulted journals are related to Science Direct, Springer Link, Wiley Online Library, and Google Scholar. The main results show that the sustainable is responsible for solutions to the deterioration of the human-environment system with the help of sustainability and sustainable development. Sustainability measures the level of quality of this system in order to evaluate its distance from the sustainable. Sustainable development works with strategies to bring the level of sustainability closer to the sustainable human-environment system. The attributes of these terms have distinct meanings and relate to specific praxis, but they converge to a single goal. Thus, an axiomatic concept of these terms assists in praxis to hold areas with distinct functions accountable, but with a single final attempt to achieve the idea of a sustainable human-environment system. We hope this work may prompt further study on these terms and help in understanding their praxis and theoretical application.

Keywords: Sustainable. Nature capital. Environmental/human system.

Sustentabilidade e desenvolvimento sustentável: desvendando as sobreposições e alcances de seus significados

Resumo

Sustentável, sustentabilidade e desenvolvimento sustentável são termos notáveis e oportunos em nível global. Entretanto pelo fato de serem desprovidos de conceitos axiomáticos geram críticas e dúvidas na práxis. Este estudo objetiva analisar os atributos de sustentável, sustentabilidade e desenvolvimento sustentável visando contribuir para o axioma de seus conceitos. Esta pesquisa tipifica-se em qualitativa, bibliográfica e interpretativa. As bases de periódicos consultados relacionam-se a *Science Direct, Springer Link, Wiley Online Library e Google Scholar.* Os principais resultados revelam que "sustentável" tem a incumbência pelas soluções à deterioração do sistema ambiental humano com auxílio da sustentabilidade e do desenvolvimento sustentável. A sustentabilidade mensura o nível da qualidade deste sistema com intuito de avaliar o seu grau de distância em relação ao sustentável. O desenvolvimento sustentável atua com estratégias para aproximar o nível de sustentabilidade ao sistema ambiental humano sustentável. Os atributos destes termos possuem significados distintos e relacionam-se a uma práxis específica, entretanto, convergem a um único objetivo. Sendo assim, um conceito axiomático destes termos auxilia na práxis para responsabilizar as áreas com funções distintas, mas com um único intento final, o de alcançar a ideia de sistema ambiental humano sustentável. Salienta-se que este estudo pode ser o início de discussões mais profundas sobre estes termos e auxiliar no entendimento de sua práxis.

Palavras-chave: Sustentável. Capital natural. Sistema ambiental humano.

Sustentabilidad y desarrollo sostenible: desvelar las superposiciones y alcances de sus significados

Resumen

Sostenible, sostenibilidad y desarrollo sostenible son términos notables y oportunos, a nivel global. No obstante, por el hecho de estar desprovistos de conceptos axiomáticos generan críticas y dudas en la praxis. Este estudio se propone analizar los atributos de sostenible, sostenibilidad y desarrollo sostenible para contribuir al axioma de sus conceptos. Esta investigación se tipifica en cualitativa, bibliográfica e interpretativa. Las bases de datos utilizadas para consulta de periódicos fueron *Science Direct, Springer Link, Wiley Online Library y Google Scholar*. Los principales resultados revelan que sostenible tiene la incumbencia de las soluciones al deterioro del sistema ambiental humano con el auxilio de la sostenibilidad y del desarrollo sostenible. La sostenibilidad mide el nivel de calidad de ese sistema con la intención de evaluar su grado de distancia en relación a lo sostenible. El desarrollo sostenible actúa con estrategias para aproximar el nivel de sostenibilidad al sistema ambiental humano sostenible. Los atributos de estos términos poseen significados distintos y se relacionan a una praxis específica, pero convergen en un único objetivo. De esta manera, un concepto axiomático de estos términos auxilia en la praxis para responsabilizar a las áreas con funciones distintas, pero con una sola finalidad: alcanzar la idea de sistema ambiental humano sostenible. Se destaca que este estudio puede ser el comienzo de discusiones más profundas sobre estos términos y colaborar en el entendimiento de su praxis.

Palabras clave: Sostenible. Capital natural. Sistema ambiental humano.

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INTRODUCTION

The terms sustainable, sustainability and sustainable development, although greatly used in scientific literature, in private sectors and in public schools, has yet to reach a consensus in terms of concept. In the literature, there is a vast diversity of concepts, related, in a preeminent way, with sustainable development (LINDSEY, 2011). However, these terms' meanings can vary by virtue of the number of perspectives and relations to the context, as well as field (STEPANYAN, LITTLEJOHN and MARGARYAN, 2013).

This concept diversity is explained by the lack of clarity in the terms, which also leads to a point of convergence among several areas of epistemology (HARLOW, GOLUB and ALLENBY, 2013). These authors complement that it is difficult to reach a definition, and, moreover, it is also hard to apply its praxis, which has caused consistent discussions in the literature (CIEGIS et al., 2009). Bolis, Morioka and Sznelwar (2014) highlight that the inability to translate the environmental and the sustainable development discourse happens because of the terms' polysemy, which harms its credibility. Therefore, studies about these terms must recognize the existence of their many applications, knowing them to be dependent on cognitive orientation (YOLLES and FINK, 2014).

Despite these terms' disagreeing concepts, their search for balance between human being's needs and the environment is generally accepted, as well as their effort to understand both sides' complex interaction dynamics in order to deepen and broaden their meaning (BARBOSA, DRACH and CORBELLA, 2014). Another aspect of the consensus on the term is that is represents something positive and good (BAÑON GOMIS et al., 2011). The many discussions attached to the terms sustainable, sustainability and sustainable development occur in an effort to improve human well-being in the long term through management of the human environmental system (ADAMS, 2006; SEAGER, 2008).

Image source: Tera. Available at:http://www.teraambiental.com.br/hs-fs/hubfs/images/Blog_images/Sustentabilidade_e_desenvolvimento_sustentvel.jpg?t=1501252468803&width=654&name=Sustentabilidade_e_desenvolvimento_sustentvel.jpg. Accessed on Sept. 18, 2017.

Despite global acceptance of the idea of sustainability, a variety of scholars disagree on the concept's comprehensiveness and make efforts towards filling the gaps to avoid erroneous interpretations (MAZLOOMI and HASSAN, 2008). The interpretation of the term is considered inconsistent, as well as possessing high level of ambiguity. It also seems unable to encompass problems related to poverty, environmental degradation and the role of economic growth (MORI and CHRISTODOULOU, 2012; SLIMANE, 2012). In this context, this study aims to analyze the characteristics of sustainable, sustainability and sustainable development seeking to contribute to their concepts' axiom.

This study is justified since the terms sustainable, sustainability and sustainable development have faced, in the last decade, the need to be reexamined, since present society uses them ambiguously, and misuses them, in many cases, with the idea of growth, progress, maturity, evolution and wealth (RÍOS-OSÓRIO et al., 2013). Furthermore, in 1987, the concept of sustainable development attracted significant criticism. As such, it is necessary to have a coherent understanding of its meaning – it is observable that many use these terms as synonyms, and others, as different concepts (YOLLES and FINK, 2014). These terms, in special their concepts are in need of a profound scientific discussion before they are used as a basis for decision-making (BOLIS, MORIOKA and SZNELWAR, 2014).

THEORETICAL REFERENCES

Origin and recognition of the term sustainable

The book *Sylvicultura Oeconomica oder Anweisung zur wilden Baumzucht* (Chart 1), published in 1713 by Carlowitz, presented the novel idea of *nachhaltend* or *nachhaltig* (sustainable), comprehending the pillars of ecology-nature, of economic and of social ethics (PISANI, 2006). In the first half of the 18th century, the idea of *Nachhaltigkeit* (sustainable revenue) reached Denmark, Norway, Russia and France (GROBER, 2007).

Western civilization progress reached its peak between 1750 and 1900. In that period, scientific progress was consolidated, identifying nature could be ruled through science. However, in 1789, the industrial revolution's first negative effects began to appear, such as unemployment, poverty and disease (MEBRATU, 1998).

After 277 years of Carlowitz's work being published, *Silent Spring* was published (Chart 1), which inspired a fusion between the ideas of progress, growth and development, pointing to a new direction for sustainable development (PISANI, 2006). Consolidation of those conceptual bases was achieved on the premise that society should be stable and indefinitely sustainable in order to improve human condition (GOLDSMITH et al., 1972) and that ecological stability and sustainable economy, in the long term, would be capable of satisfying basic human conditions, but also on the comprehensiveness of environmental, social and economic aspects (MEADOWS, 2004).

Chart 1

Main Publications and Congresses

Occurrences	Year	Author and year
Hans Carl Von Carlowitz in Germany, influenced by Evelyn's (1664) and Colbert's (1669) ideas about rapid forest devastation in Europe, published the book ***Sylvicultura Oeconomica oder Anweisung zur wilden Baumzucht***, which focuses on the scarcity of wood, demonstrating alternatives for efficient consumption, reuse of energy, reforestation and substitution of wood for fossil energy, in a search for balance between the cutting and the renovation of wood, seeking its continuous and perpetual use.	1713	Grober (2007) Pisani (2006)
Rachel Carson publishes ***Silent Spring***, in which she demonstrates the use of insecticides and pesticides, and exposes the soil, air, water, as well as human, animal and vegetation degradation caused by them.	1960	Carson (1962)
United Nations Conference on the Human Environment (UNCHE), held in Stockholm, focused on the idea of sustainability, demonstrated that it would be possible to reach economic and industrial growth without harming the environment. This conference originated Meadows' (2004) book ***The Limits of Growth***, which focused on industrial acceleration, population growth, undernourishment, non-renewable resource depletion and environmental degradation.	1972	UNCHE (1972)
World Commission on Environment and Development (WCED or Brundtland Commission) presented the report ***Our Common Future,*** developed by the United Nations (UN), centered on the needs and interests of humanity, the security of global patrimony for future generations and on the redistribution of resources to the poorest nations.	1987	WCED (1987)
United Nations Conference on Environment and Development (UNCED), known as Eco-92 or Rio-92, sought to conciliate social-economic development with accountability and environment preservation. In Rio-92, were elaborated: a) the Rio declaration that establishes international agreements to protect and respect the integrity of ecology and global development, starting with environmental management and sustainable development; and b) Agenda 21, which is centered on the implementation of programs and environmental policies.	1992	UNCED (1992)
Rio+10, held in Johannesburg (South Africa), centered on the annihilation of poverty and defined that sustainable development has three-pillar formation (***Triple Bottom Line***): environmental, social and economic.	2002	Rio+10 (2002)
United Nations Conference on Sustainable Development (UNCSD), in Rio de Janeiro, known as Rio+20, focused on the renewal of the commitment on sustainable development formalized in many countries in previous conferences. This conference originated the document entitled ***The future we want***, with a primary focus on issues such as the use of natural resources, and social issues like lack of housing.	2012	UNSCD (2012)

Source: Elaborated by the authors.

The debates that occurred between 1960 and 1970 about economic growth demands, development and industrial nations' lifestyle tormented the ecologic balance, the economic stability and the planet safety, providing, thus, the inspiration for the creation of sustainable development, in order to balance growth limits with development needs (MITCHAM, 1995).

The term sustainable development was popularized and broadly used in the 1980's and 1990's (PISANI, 2006). Its global inauguration occurred in 1987, through the Brundtland Commission report (GROBER, 2007), which incited, in the beginning of the 1990's, great quality and volume expansion of environmental legislations, as well as international agreements that, beside mapping the environmental alterations profiles, also served to instigate global political change (ADAMS, 2006).

Hofer (2009) highlights that Rio 92 established a series of initiatives to promote acceptance of the sustainable development idea. In the perception of Ríos-Osório et al. (2013), in Rio 92 there was an effort to recognize and share responsibilities in order to change trends of negative impacts on natural resources. The conferences held in 2002 (Rio+10) and 2012 (Rio+20) focused on reinforcing the discussions and commitments made on the issue of sustainability by private and public sectors, gearing them towards poverty, social justice, and economic growth and development.

Doubts and misunderstandings generated by the term sustainable

The understanding of the term sustainable is related to several meanings as a result of different perspectives, motivations and aspirations from researches and social groups in relation to the theme (BLEWITT, 2008; BARBOSA, DRACH and CORBELLA, 2014; YOLLES and FINK, 2014). Kidd (1992) and Adams (2006) defend that the term is overloaded with possible conflicting ideas, having, thus, to explain various meanings.

These various meanings arose from the integration of different intellectual and political currents, such as (GATTO, 1995; MEBRATU, 1998; PAEHLKE, 2005; CIEGIS et al., 2009): a) biology, aimed at the defense of correct exploitation of natural resources, which is manifested in constant and perpetual revenue; b) ecology, which is linked to the preservation of individual species in ecosystems subjected to human intervention; c) the economy, which adheres to economic growth without compromising natural resources; and d) sociology, which is linked to a development that preserves society while maintaining social relations.

These complex and multidimensional relations bring several negative critiques to the term: a) vagueness (MEBRATU, 1998; FABER, JORNA and VAN ENGELEN, 2005; PAEHLKE, 2005; NEWTON and FREYFOGLE, 2005; MOLDAN et al., 2012; MORRIS, 2012; MORI and CHRISTODOULOU, 2012; SLIMANE, 2012); b) polysemy (GATTO, 1995; MEBRATU, 1998; PAEHLKE, 2005; MORI and CHRISTODOULOU, 2012; SLIMANE, 2012); c) little explained (SARTORI et al., 2014); d) confusing and controversial (YOLLES and FINK, 2014); e) useless (CIEGIS et al., 2009; MORRIS, 2012); f) polemic and confusing as to the means and ends (NEWTON and FREYFOGLE, 2005); g) misunderstood (EKINS et al., 2003); h) popular slogan (SLIMANE, 2012); among others. However, Bañon Gomis et al. (2011) highlight that sustainable is not only a "fashion or tendency" valued by circumstantial conditions, but its importance is linked to the ethics that guide human conduct, in that sense, it reflects the values of courage, prudence and hope.

The concept of sustainable development is considered everlasting, since it is flexible, and open to interpretation (PRUGH and ASSADOURIAN, 2003). Kidd (1992), Adams (2006), Redclift (2006) and Barbosa, Drach and Corbella (2014) highlight that the criticism it receives can be seen as opportunities, since they allow irreconcilable positions to find common ground without compromising their positions. Bolis, Marioka and Sznelwar (2014) observe that the understanding of its many uses is important since there is a confrontation of different points of view so that the most pertinent one can be adopted in an epistemological perspective.

Another question that provokes ample doubts and criticism is related to the use of the idea of sustainable in complex dynamic systems. On this subject, Prugh and Assadourian (2003), defend that values, policies and comprehension of the planet and of the human natural system evolve, and the notions of what is sustainable are not static. The idea of sustainable is characterized as a principle applicable to systems, involving an interaction of dynamic systems that change constantly (SARTORI et al., 2014). According to Yolles and Fink (2014), sustainable is originated from the viability and adaptive capacity of systems and involves limits in the capacities of natural resources to absorb the impact caused by humans, and also in the context of development scope.

Human resources support society and economy, and the natural resources available on Earth present a finite limit. In this case, effective limits correspond to the biosphere capacity to absorbing pollutants, and the supply of natural resources and energy is clearly limited in space and time (ADAMS, 2006; QUENTAL et al., 2011).

The literature also points to a lack of definition of basic information, such as (COSTANZA and PATTEN, 1995; SILVA NETO and BASSO, 2010): a) what should be sustained? b) When to evaluate what should be sustained? c) It should be sustained for how long? Faced with these questions, Redclift (2006) and Morris (2012) propose that, despite the literature's ample examples on these issues, it is not yet possible to define or explain what must be sustained. The answers to these questions are of complex definition, since they demand human environmental system interaction observation along with their organizational, spatial

and temporal complexities (LIU et al., 2007a,b; LASSOIE and SHERMAN, 2010), Holling's (2001) panarchy, and Schumpeter's (1950) creative destruction.

Therefore, Redclift (2006) highlights that is improbable that future generations will be equal to present generations in aspects such as needs, cultures, and behaviors, among others. Seager (2008) affirms that sustainability and sustainable development occur through the succession of different states, in opposition to *status quo* preservation. In this sense, to assess the needs of present generations does not pose a problem, but to estimate the needs of future generations would be almost impossible (MORRIS, 2012).

Methodologies

The type of research in this study is qualitative, since it uses the subjective interpretation of textual information elaborated with scientific content. The technical procedure used is consistent with bibliographical research, since it carries out a survey of articles and chapters of scientific books dispersed in numerous journals containing a blind peer review.

This bibliographic research was carried out observing the systematics suggested by Lakatos and Marconi (2012), who proposed the following steps: a) choosing the theme: the theme sustainability and sustainable development, in this research, was defined for their consensus difficulty and lack of clarity in its definition; b) elaborating the study plan: the structure of the study, the sections and subsections and the formulation of the objective were determined; c) identification: the keywords were selected by a group of professors[1]: *Concept of sustainability, concept of sustainable development e origin of the concept*; d) location: stage in which the scientific journals were selected, which were defined together with the abovementioned professors, using publication impact criteria, access convenience and level of discussion on the topic; E) compilation: the bibliographies were compiled in an electronic file and grouped by affinity in relation to the theme; f) filling: the contents of the bibliographies were organized in tables containing author and year, objective of the study, main results, criticisms and the author's position in relation to the theme; g) analysis and interpretation: the study used interpretative analysis with scientific rigor; and h) writing: it was written descriptive-textual way, containing textual fragments that support the issues defended in this study.

In the localization stage, the journal databases were selected: Science Direct, Springer Link, Wiley Online Library and Google Scholar. The researched literature covered only foreign publications in the English language – about 85% of global scientific publications are in English (SCHÜTZ, 2010), which justifies this choice. The materials are limited to articles and chapters of scientific books, since they have a consistent informative content and have been validated by blind peer review. The selected timeframe begins in the year 1664, with the publication of *Sylva*, by John Evelyn. It is considered that with this work initiated the concern with environment depletion and economic development. The year 2014 is considered the final period in this research.

The keywords selected in the identification stage were inserted in the journals' advanced search tab. It was defined that these words had to appear in the title, abstract and in keywords. The bibliographies were collected between June and July of 2014.

The collected papers for this research resulted in a total of 83 titles distributed in: Science Direct (11), Springer Link (7), Wiley Online Library (5) and Google Scholar (50) (compilation stage). After the collection of the bibliography, titles, abstracts and references were attentively read (filling stage). Titles and abstracts were read in order to select only the articles and books pertinent to the focus of this research, as to the references, the objective was to increase the number of bibliographies. The articles and books cited in the references that linked to the keywords were also retrieved, regardless of the journals in which they were inserted, but taking peer review into account before publication. The total of bibliographies scavenged was 150, and, after reading the respective titles, abstracts and references of all articles (233), 120 were selected. This selection took place through a reading of titles and abstracts analyzing the content of the bibliography pertinent to the research's central core, which is related to the discussions about the concepts of sustainability and sustainable development. In addition, reference analysis was guided by the bibliographies' qualification levels in Capes (Coordination for the Improvement of Higher Education Personnel)' Qualis. After being selected, the 120 bibliographies were fully read. Out of the selected titles, only 108 were pertinent to the present research's central scope.

[1] These professors with doctoral degrees are linked to the post-graduate program in Environmental Quality (Masters and Doctorate) at Feevale University. The choice for this program and professors is based on the concentration of studies in the field of environmental sciences with focus on sustainability and sustainable development, located in the Southern region of Brazil.

The type of textual analysis used to study the information is linked to interpretative analysis (see SEVERINO, 2007), which aims at synthesizing ideas and concepts in order to have a deeper understanding of textual information (analysis and interpretation stage). Through this interpretative analysis, we sought an interpretation and association of the ideas exposed in the bibliographies, and also among other bibliographies that had another approach, without any kind of interference. Finally, the last stage of interpretative analysis is the critique, in which a critical judgment is elaborated and presented, positioning the research in response to the information analyzed.

RESULTS AND ANALYSIS

Sustainability

The term sustainable originated from the German expression "*Nachhaltend"* or "*Nachhaltig*" (longevity) in the book *Lyra,* by Carlowitz, from 1713, and also from the French "*durabilité"* (durability), and the Dutch *duurzaamheid* and *Duurzaam* (sustainable) (HOFER, 2009). In this context, the term reflects a solution to the shortage of natural resources since antiquity, consolidating itself throughout human culture seeking a way to utilize these resources in a continuous and perpetual way. This thinking contributes to Grober's (2007) affirmation about the idea of sustainability not as a modern environmental movement, but as a way of thinking and acting rooted in societies' cultures, which has been maturing throughout three centuries.

What sparked the idea of sustainability, according to Schlör et al. (2012), was essentially the energy system crisis that began long ago. Bolis, Morioka and Sznelwar (2014) complement that this emergence is linked to the improvement of environmental aspects with negative impacts, while presenting positive responses in the economy and in society. It is noteworthy that sustainability gained space and visibility in virtue of the discussion on energy sources and natural resources, as in to say that they are associated to the relationship between humans and environment and, especially, to the deterioration problems to the relationship between global ecology and economic development.

The Castiglioni and Mariotti (1981) Latin dictionary defines the term "*sustinere*" (sustainable) as: to defend, to maintain, to assume, to support, among other definitions. The inclusion of sustainable in the dictionary (of the English language) only occurred in 1987 (NEWTON and FREYFOGLE, 2005). As such, in this period (1713-1987), the idea of sustainable was used in several publications and discussions, but without a consistent conceptualization of its meaning. As such, the term sustainable can be conceptualized as a basis, as an umbrella term, that supports and includes the idea of sustainability and sustainable development, having the worry about future existence of natural resources to support the continuation of human life as its foundation. In short, Chart 2 presents the main attributes of the term sustainable.

Chart 2

Summary on the term Sustainable

Sustainable
Solution to the shortage of natural resources linked to energy issues and natural resources
Originated from the deterioration of global ecology and economic development
Includes sustainability and sustainable development
Concerns the future of natural resources and human life

Source: Elaborated by the authors.

The understanding of sustainability, according to Bell and Morse (2008), Moldan et al. (2012), Sartori et al. (2014), consists in the capacity of the global system, containing the integration of human environment with an indissoluble system, to maintain

its quality and/or property in a level close, equal or superior to the historic average, considering the dynamic alterations provoked by variables throughout time. Horbach (2005) and Dempsey et al. (2011) highlight that sustainability is the union of three types of interests simultaneously and in balance, including environmental, economic and social aspects. Faber, Jorna and Van Engelen (2005) defend that sustainability comprehends the balance and mutual interactions between object and its supporting environment, without harmful effects to both.

The concept of sustainability, according to Ferreira (2010), is a condition or quality of something that can sustain, defend, maintain or conserve something else. Following that logic, quality refers to "[...] the property to which something or someone is individualized, distinguishing it from the others [...]" (DICIONÁRIO MICHAELIS, 2015); as such, sustainability refers to the human environmental system level of quality.

Sustainability requires a quantitative evaluation, meaning, to quantify or measure the level or quality of a system (TODOROV and MARINOVA, 2011). This measurement can be made through indicators and indexes (SINGH et al., 2012; MOLDAN et al., 2012), among other modalities. Therefore, after analyzing the concept of sustainability's properties, an integrated concept for their basic ideas is developed, as shown in Chart 3.

Chart 3

Summary on Sustainability's Properties

Sustainability
Quality and property of the global human environmental system
It considers the temporal dynamic evolutions
Includes environmental, economic and social aspects
Mutual balance
Evaluation of indicators and indexes

Source: Elaborated by the authors.

Sustainability is a term that expresses the preoccupation with the quality of a system that concerns indissoluble integration (environmental and human), and evaluates its properties and characteristics, including environmental, social and economic aspects. This evaluation is made at a determined static point, as if someone had taken a photograph of the system, that is, its quality in that instant, even though the system is dynamic and complex. The evaluation of the system quality must accompany natural evolution – disconsidering anthropogenic alterations. Therefore, indicators used in the evaluation can suffer alteration throughout time – a few can be faster, and others slower, depending on the aspect to which they are referred to. Evaluation is operated through indicators and/or indexes, and results from quantitative information, enabling the establishment of objectives or goals to be reached through long term strategies.

Sustainable development

The expression sustainability was used in the context of development for the first time in 1974 in a series of conferences about forest issues (KIDD, 1992). However, Barbosa, Drach e Corbella (2014) underscores that the origin and the concept of sustainability in this context are unknown. They point out, however, that the first definition came in the First World War, as described by Lester Brown mid-1980s. On the other hand, Shrivastava e Hart (1994) highlight that sustainable development in its definition has roots in the publication of Carson's (1962) *Silent Spring*. Therefore, the idea of sustainable development was initially translated as "[...] a sustainable society is one that can satisfy their need without compromising future generations' chances of survival" (BROWN, 1981, p. 20). It is the understanding that in this context society does not reach human civilization alone, but the whole set of complex environmental, social and economic aspects. It is also noted that

Evelyn's (1664) idea of sustainability had the same essence, but with greater emphasis on natural resources. The ideas in these concepts were used in the Brundtland Report, in 1987, to define sustainable development.

Thus, having been popularized through the Brundtland Report in 1987, it was defined as "[...] one that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 19). It is noteworthy that, although this concept is the most quoted in the literature and has been credited to WCED, its original idea is by Evelyn (1664). Despite the confusion of credit assignment in relation to the idea, the concept has two key issues: the idea of the essential needs of the poor (which should be given absolute priority, according to BARKEMEYER, 2014), especially in developing or underdeveloped nations, and the limitations imposed by technologies and social organizations regarding environmental ability to meet present and future basic needs. Therefore, it is perceived that the dynamic tension between poverty and environmental concern is presented, considering the continuation of human life within certain environmental restrictions.

WCED (1987, p. 1) complements on sustainable development: "[...] a global agenda towards change [...]"; "[...] new norms of behavior in all levels and in the interest of all [...]"; "[...] and at the same time social and environmentally sustainable [...]".

Analyzing the definition of sustainable development, it is understood that it does not present a "magic recipe" solution to save the environment from degradation and depletion, but it suggests a change in humanity's behavior.

Moreover, this concept does not only mean saving the environment or some particular species, but human survival (BARTER and RUSSELL, 2012). He also points to a clear statement that the human environmental system makes up a single, indivisible system, since by mentioning the "generations" it refers to generations - past, present and future - related to the human environment, since they are inseparable. This idea is corroborated by Weiss (1992), when he emphasizes that intergenerational equity corresponds to maintaining the planet's natural resources we share with other species and humans, in past, present and future generations.

In the words of Barter and Russell (2012), the definition of sustainable development does not refer to saving nature, but to the internalization of strategies, and thus adding new resources to enable economic growth and prosperity to be shared by all. This term, sustainable development, refers to a series of processes and practices, involving action, and focusing on the improvement of human life (WCED, 1987; BLEWITT, 2008; UNSGHLPS, 2012), providing a long term vision "to eradicate poverty, reduce inequality, make growth inclusive, and turn production and consumption more sustainable" (UNSGHLPS, 2012, p. 6). The term action or act of acting, indicates that the survival of the human race cannot be outsourced, that is, the strategic attitudes that aid in our survival must start from humanity itself.

It is important to note the importance given to the strategic issue, especially in relation to corporations, which are seen as essential actors in the face of innovations, practices and technologies that can help to generate sustainable results (BARTER and RUSSEL, 2012). Lélé (2013) complements that the Brundtland Report has defined the term "sustainable development" as the core of development discussions. In the meantime, sustainable development, combined with humanity's social and political projects development, has promoted efforts to find ways and through them make societies more sustainable (SALAS-ZAPATA et al., 2011). After analyzing the concept of sustainable development published by WCED (1987), concepts on this topic defined by other researchers are presented.

Sustainable development, for Moffatt (2007), means that sustaining an activity or process ensures that a system works in the long term. Others understand the idea that, in a future, life will be healthier than in the present (BLEWITT, 2008). Bañon Gomis et al. (2011) defines it as a habitual way of acting, and as a consequence, people should avoid destructive effects on environmental, social and economic domains, consistent with a harmonious relationship that promotes a promising life. These concepts points towards human progress and development in quality of life through continuous economic growth (BARTER and RUSSELL, 2012), that is, the impacts mainly affect the human population and their well-being (MOLDAN et al., 2012).

It is worth noting that sustainable development aims at a new vision of economic growth, as confirmed by WCED (1987, p. 1) "[...] a new era of economic growth". Barter and Russell (2012) identify economic growth as fundamental to enable human survival. Ayres (1996) argues that the concept of sustainable development guides how humanity must act in relation to nature, and be responsible for its own generations. Based on this, Lozano (2012) emphasizes that economic growth must be based on social justice and the efficient use of natural resources. Harlow, Golub and Allenby (2013) complement that economic growth and modernization are dominant characteristics of sustainable development.

Thus, humanity must change its values, personal and institutional behaviors, and, in particular, rethink its relations with the planet (BAÑON GOMIS et al., 2011). Barbosa, Drach and Corbella (2014) argue that this is a process of change through long term social learning. Therefore, based on the results and discussions of this subsection, it is perceived that the concept of sustainable development presents intrinsic information and that should be observed in the development of strategies (Chart 4).

Chart 4

Summary of Sustainability's Properties

Sustainable development
Aims towards economic growth without human-lead damage to the environment
Long term view in relation to future generations
Includes environmental, economic and social aspects in mutual balance
Proposes changes in humanity's behavior
Materialized through strategies
Involves processes and practices

Source: Elaborated by the authors.

Sustainable development can be conceptualized as a strategy used in the long term to improve societies' quality of life (well-being). This strategy should integrate environmental, social and economic aspects, especially considering environmental limitations, due natural resources access in a continuous and perpetual way. The strategy concept, that is, the act of managing, is elaborated based on sustainability assessments results, and focuses on the negative aspects, recovering or normalizing to the point where the evolutionary process of the system occurs naturally.

The connection between sustainability and sustainable development

The analogies between sustainability and sustainable development advance towards an interrelationships understanding of a single system composed of human and environmental activities. Such understanding has a dual purpose: to satisfy humanity's needs and to support life-sustaining systems (LAMBIN, 2005; BRINSMEAD and HOOKER, 2011). Thus, sustainability encompasses systems and sustainable development looks towards human needs and their well-being. Human beings are not independent and isolated, they are part of a complex web of natural phenomena inserted in a single global system, which Moldan et al. (2012) calls a myriad of relationships and interdependencies.

Sustainable development is the key to achieve sustainability, which is considered the final long-term goal (HOVE, 2004). Sustainability consists of a goal or parameter (final objective) defined through scientific criteria, which measures and tracks the results generated by the use of sustainable development strategies. In order to achieve the sustainability of a given global system – to raise the level of sustainability quality – it is necessary to use the sustainable development process, corroborating Prugh and Assadourian (2003) and Sartori et al. (2014). Stiglitz, Sen, and Fitoussi (2009) emphasize that humanity is in need of an assessment on where we stand in relation to the satisfactory level of sustainability.

The process of sustainable development is supported by actions linked to technical, financial, managerial and, in particular, strategic skills to achieve sustainability, this reflection being consistent with Horbach (2005) and Dempsey et al. (2011). It should be noted that sustainable development actions can alter system quality, Jabareen (2008) argues that such actions allow intensive interventions in sustainability.

The guidelines that led to sustainable development were based on the principles of sustainability. This reflection is in line with the long term vision, with the observation of the importance of regional and/or local conditions, with the understanding of the nonlinear evolutionary dynamics of integrated and inseparable human environmental systems, among others

(MOLDAN et al., 2012). The long term vision is linked to the idea that the global system has an indefinite useful life and in this temporality sustainability must be maintained at a healthy level. However, this global system undergoes adaptations and evolutions, which demands changes in the measurement of sustainability's levels and continuous strategy improvement coming from sustainable development to maintain that level. This idea is supported by Gaussin et al. (2013), who maintain that sustainability and sustainable development aim to leave to future generations a capital reserve at least analogous to the one the current generation has received as a legacy from previous generations.

Sustainable development brings two antagonistic ideals – capitalism and ecology – into one common goal to improve the quality of the system (sustainability). This position is also observed in Sachs (1993), who argues that sustainable development has attracted a large number of followers from different areas, bringing ecology, referring to sustainability, and economy closer, in search of sustainable development. Jabareen (2008) points out that sustainable development has the capacity to solve the ecological crisis without affecting economic relations. As such, with the idea of sustainable development in mind the objective is to solve the paradox between environmental (sustainability) and economic (development). Sneddon, Howarth and Norgaard (2006) point out that the starting point of this contradictory union officially began with the publication of the Brundtland Report, which demonstrates concern about environmental and developmental dilemmas. In sum, the connections between sustainable development and sustainability are explicit, as shown in Chart 5.

Chart 5

Summary of the connections between sustainability and sustainable development

Sustainable development <===> Sustainability
Human needs and well-being <===> Global human environmental system
Access form <===> Final intent (long term)
Strategies <===> Goal (parameter)
Capitalism <===> Ecology
Economic <===> Environmental

Source: Elaborated by the authors.

Furthermore, sustainability can be reached through integrated and holistic management of the human environmental system. Jabareen (2008) emphasizes this system's protection of environmental, social and economic issues must integrate the sustainable development process. This protection effort can be made through the union of all stakeholders – government policies, organizational, social and others – in international, national and regional levels.

FINAL CONSIDERATIONS

The use of the terms sustainable, sustainable and sustainable development at the global level is noteworthy and timely, but due to the embryonic factor of these terms, still lacking an axiomatic concept, they still generate criticism and doubts in its theoretical and practical application. In this context, this study analyzed the attributes of those terms through bibliographic research, in order to contribute to its axiomatic conceptualization.

The main results show that the term sustainable is responsible for formulating a solution in relation to the deterioration observed in the interrelationships of the global human environmental system. The concept of sustainable is supported by the process of sustainable development and sustainability, that is, it can be considered an "umbrella term". Therefore, the direction and focus of sustainability and sustainable development must be aligned with the ultimate intent of being sustainable considering the equity of environmental, social and economic aspects.

Sustainability is a process that measures the degree or quality level of the complex human environmental system in order to evaluate its distance from the sustainable. This evaluation, in particular, is carried out with quantitative properties denominated sustainability indicators and indexes. These, in turn, can identify which aspects – environmental, social or economic - if the system does not reach the desired sustainable level – are responsible and which should be repositioned or corrected.

Sustainable development is the process that comes into play based on strategies to bring the human environmental system closer to the sustainability level so that the life of this complex system harmonizes and perpetuates over time. This strategic issue attempts to break paradigms through changes in society's understanding and cultural positioning, that is, to raise awareness of its importance with the help of actions and attitudes that reposition the negative aspects identified by the indicators towards greater sustainability. In this way, with the successful conduct of sustainability and sustainable development, we achieve the sustainable.

The attributes of sustainability, sustainability and sustainable development, in general terms, have different meanings and can not be used as synonyms, since each relates to a specific praxis. However, they cannot be considered as isolated practices, since success in reaching the sustainable occurs through a combination of sustainability and sustainable development set of attributes. Thus, an axiomatic concept of these terms assists in the praxis to determine responsible areas with distinct functions, but with the final goal of achieving the sustainable human environmental system idea. It is noteworthy that this study may be the beginning of deeper discussions on these terms and further the understanding of their practical and theoretical application.

The limitations of this study regarding the results are related to the use of the English language content: in this language there is, on average, 85% of the global knowledge. In this case, there may be studies that were not included in this research, but that, in this information collection, may not significantly affect the results.

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