CONDITIONS AND CIRCUMSTANCES FOR TRANSDISCIPLINARY SUSTAINABLE DEVELOPMENT

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ABSTRACT

Current sustainable development global problems, like uneven income distribution, overpopulation, neo-imperialism, destruction of ecosystems, lack of human development vision, etc., cannot be adequately tackled from the content of a single academic disciplines. Moreover, integrated systems solutions cannot be achieved through a simple accumulation of different views, since academic disciplines from social and natural sciences could be conceptually in contradiction. Therefore, new common concepts beyond disciplines are required, otherwise also solutions could be in contradiction and consequently ineffective. Up till now, progress in finding solutions has been very slow. The public is becoming increasingly aware that the mainstream political and economic mechanisms are unable to provide effective solutions. Transdisciplinarity is a new way of thinking and understanding of complex systems problems, since it crosses borders of separated and isolated disciplines. The goal of the article is to integrate the concept of sustainable development with the concept of transdisciplinarity. The article proposes new models for establishing necessary Conditions and Circumstances for developing and implementing new holistic sustainable development vision and goals. Before focusing on specific sustainable development systems solutions, transdisciplinary Conditions and Circumstances have to be met.

KEY WORDS: Sustainable Development, Transdisciplinarity, Human Values, Logic of Included Middle;

1. INTRODUCTION

Unsustainable development leaves behind large areas of poverty, stagnation, marginality, and destruction of the natural environment (United Nations, 1971). Developing a readiness to deal constructively with necessary openness to new approaches is a leading challenge facing society today. A demand for deep and fundamental change, however, stands in conflict with the continued practice of the industrial development model. In order to get to know sources of the problems, the Circumstances[1] and Conditions[2] under which humanity live must be recognized. We are intrinsically tied to them and therefore, should never be ignored.

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[1] In the article connotation of the word "Circumstances" refers to the outer, visual world in macro-physical environment.

[2] The term "Conditions" connotes the inner, invisible world in micro-quantum, spiritual sphere. However, Conditions and Circumstances are inherently linked to each other and cannot be separated.

The article is structured in a way, to introduce the problem and the general concept of transdisciplinarity (hereafter TD) in the first phase. The core of the article represents integration of the concept of TD and sustainable development (hereafter SD). It starts with presentation of the TD Conditions and Circumstances for finding SD solutions at elementary (individual) level. Thereafter follows introduction to so-called TD S-O-S model at organizational level and so-called O-S-O model at national-global level. Both models represent an upgrade of the basic TD model towards SD. Concluding thoughts follow at the end of the article.

1.1. The Problem

SD global problems, like uneven income distribution (poverty and new era slavery), unemployment, overpopulation, neo-imperialism, forced migrations, destruction of ecosystems, neoliberal governance, lack of human development vision, enforced destructive way of living, etc., cannot be adequately tackled from the content of a specific academic discipline. Such problems are complex systems (system-of-systems) problems that require systems solutions and translation between different "vocabularies". Each discipline has its own language, tools, methods, journals, and creates its own metaphors. Thus, the same words could mean different things to different disciplines (Hammer & Söderqvist, 2001). How to facilitate the reconciliation of tensions between fragmented disciplines, their divergent opinions and policy processes that constitute the contemporary SD debate? New ways of thinking are needed in order to unite traditional disciplines beyond the classical notion of science (traditional boundaries) and to fill the knowledge gaps between them. Lessons from systems thinking and the science of complexity are suggestive of some potential in this context (Meppem & Gill, 1998).

SD global problems consist not only some of the environmental issues (broadly known as climate change and biodiversity loss), but mostly of social issues. They are not bygone problems, but they rather continue to be with us in the current era of globalization, where there are much more losers than winners (Stiglitz, 2006). The meaning of SD is hidden in connections between different disciplines, with other words, each discipline gives other discipline a meaning and consequently also a new content. How to establish an environment (Conditions and Circumstances) where complex SD questions could be answered and where appropriate knowledge would be developed? To answer this question is the fundamental goal of the article.

Sustainable and desirable vision requires imagination that comes not only from rational logic, but from human values (Meadows, 1996, pp. 117). Most of today's attempts to solve SD problem are based on "green reformism" as the problem areas (economy, ecosphere and sociosphere) are still considered in separated and isolated environment. At the normative level concepts and views of sociosphere, ecosphere and economy are in contradiction (or even conflict) and consequently also non-TD SD solutions at positive level are contradictory, inconsistent and inefficient. Nature of SD

systems behavior is nonlinear and holistic. Nowadays, the vision of human activities is mostly additively linear and reductionistic[3] at all levels of social integration.

"Green reformism" represents the mainstream response to the current ecological crisis. The term refers to the support for improved technology and resource efficiency combined with a commitment to the logic of neoliberalism. This approach refuses to acknowledge the historical and systems reasons for crisis (Rotering, 2011). Rotering believes that it is founded on paradoxical basis, because it simultaneously adopts neoliberal capitalism and at the same time rejects economic growth. Although the field has developed comprehensive way of natural resource management, it has quite deficiently defined human development vision and well-being.

It is impossible to imagine only one final solution, but rather many complex, interrelated, and evolving solutions. Essentially, the ethical dimension is a core of SD (and also TD) and without this dimension SD is similar to a fiction. The circular flow model (see Figure 1) that forms the centerpiece of the mainstream view of the SD process falsely assumes that ecological, social and economic spheres are independent systems (Mulder & van den Bergh, 2001). The inadequacy of this approach represents a major motivation to introduce linkages between the three major systems in a new models presented later in the article.

Figure 1: A mechanistic relationship between economy, sociosphere, and ecosphere
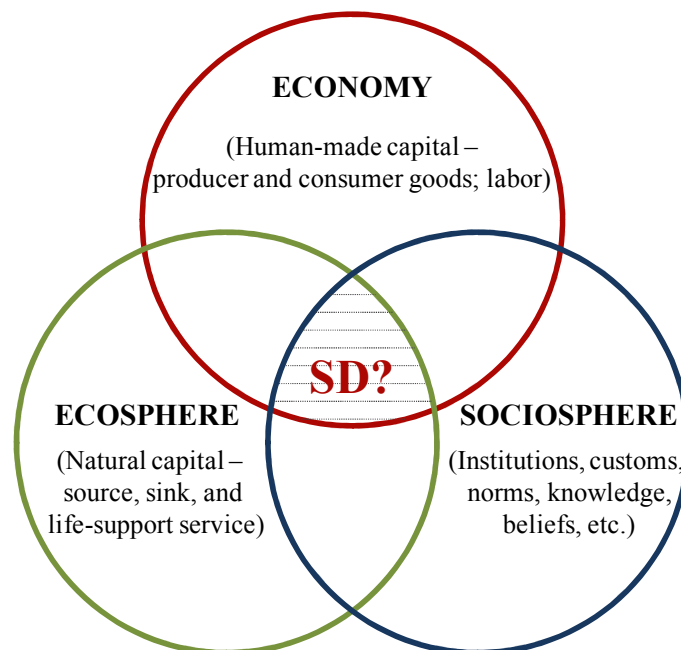
Source: Lawn, P. A. (2006). Sustainable development indicators in ecological economics, pp. 14.

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[3] Reductionist Thinking, Reductionism – Assumes that all phenomena or events can be reduced, decomposed, or disassembled sequentially into more and more basic elements. In terms of decision making, this implies that a problem can be broken into simpler and simpler sub-problems, and the solution to the original problem can be built up from the aggregation of solutions to the sub-problems (Sperry, 1983).

The present consideration of SD in the literature and media is basically reductionistic and implies mostly binary thinking[4], e.g. they promote settlement of technology and faster growth of a "green" GDP, but not saving nature and human being itself. In this linear, standard view everything is reduced either to society, economy or environment. The meaning of a self destructive human behavior as well as Apollonian[5] values is completely ignored. Reductionism, binary logic and disciplinarity (mono-, multi- and interdisciplinarity) approach are misplaced beliefs.

2. INTRODUCTION TO TD

As the prefix "trans" indicates, TD concerns that which is at the same time between the disciplines, across the various disciplines, and beyond all disciplines (Nicolescu, 2002). Along with cross-fertilization among disciplines came the recognition that there were incompatibilities among disciplines arising primarily from differences in underlying assumptions and theoretical foundations (i.e. concepts). These differences demanded conceptual knowledge unification across disciplinary boundaries. Therefore, it is obvious to transcend or go beyond disciplines to fill in knowledge voids and harmonize disciplines (Madni, 2007, pp. 5). TD offers an innovative working environment appropriate for finding evolving systems solutions to complex SD problems (Baumgärtner, Becker, Frank, Müller & Quaas, 2008, pp. 387).

TD is not a new discipline or a new superdiscipline, even though it is nourished by disciplinary research. In turn, disciplinary research is clarified by TD knowledge from a new perspective. In this sense, disciplinary and TD research are not antagonistic but complementary (Nicolescu, 2002). TD is a new way of thinking and understanding of complex systems problems. TD represents an epistemological challenge that introduces quantum logic, as a substitute for linear logic, and breaks with the assumption of a single reality (Max-Neef, 2005). While multi- and interdisciplinarity stem from classical physics and sciences, TD is based on quantum physics, chaos theory, systems thinking[6], living systems theory, consciousness sciences, and other sciences (Nicolescu, 2010a). The four pillars of TD determine the methodology of TD research (Nicolescu, 2002): multiple levels of Reality, the logic of the included middle, complexity, and integral human values.

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[4] Binary (Classical or Linear) Logic – It recognizes the existence of just one level of Reality. Such logic of Aristotelian tradition underlying most of our social, economic, and political institutions is insufficient to address SD problems.

[5] Apollonian values are divided into two value type groups. The first group – moral values consists of traditional and societal values (democratic and social values, honesty, love, equity). The second group – fulfillment values gather values related to personal, cultural, and spiritual growth (cognitive, cultural, self-actualizing and spiritual values, creativeness, knowledge, beauty and self-realization) (Musek, 2000). They consider a meaning and deep understanding of TD Subject and TD Object, respect sustainability, integrity, holism and accept diversity arising from contradictions.

[6] Systems Thinking – System's elements are viewed as an interdependent part of a larger whole (a system) and its behavior is explained by its role in that system. This is in contrast to reductionist or cause-and-effect thinking which explains system behavior by the behavior of individual components. In systems thinking, the whole is greater than the sum of its parts (Smuts, 1927, pp. 88).

3. INTEGRATING THE CONCEPT OF TD WITH SD

TD approach can be implied in SD problem solving process at different levels of social integration. The article offers insights of Circumstances and Conditions at the elementary, organizational-institutional, and national-global level in order to find evolving SD solutions. The starting point, the source of change, initially occurs at the elementary-individual level with the ability to change a level of perception and consequently a level of Reality. Pressing SD problems at each level of social integration are as follows:

1. **Elementary-individual level**: crisis of human perception of the common good in the inner and outer world; lack of Apollonian values;
2. **Organizational-institutional level**: lack of vision, imagination and knowledge in the SD context;
3. **National-global level**: defective non-visionary SD models and socio-political policies.

3.1. Conditions and Circumstances at the Elementary Level

In general there are three TD elements (see Figure 2): TD Object, TD Subject and the Hidden Third. These three elements are non-separable. The unity of levels of Reality and its complementary zone of nonresistance constitute the TD Object (Nicolescu, 2002). It represents outer world (Circumstances) which in SD terms could imply fields of ecosphere and economy such as physics, biology, economics, chemistry, etc. It is composed of physical elements providing flow of information in the environment without paying attention to relations among them. Consequently, it considers only the content of the elements while ignoring the meaning of them. Dionysian[7] values are focusing on this physical world.

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[7] Dionysian values consist of two value types groups, namely hedonistic values and values of a power. Hedonistic values contain values related to sensual and material pleasures, while values of a power involve values related to achievement, success, reputation, and also patriotism (Musek, 2000). Subjects with Dionysian values are more or less focused on transitoriness, fragmentation, and peripherality.

Figure 2: Ontological interconnectedness of TD and SD
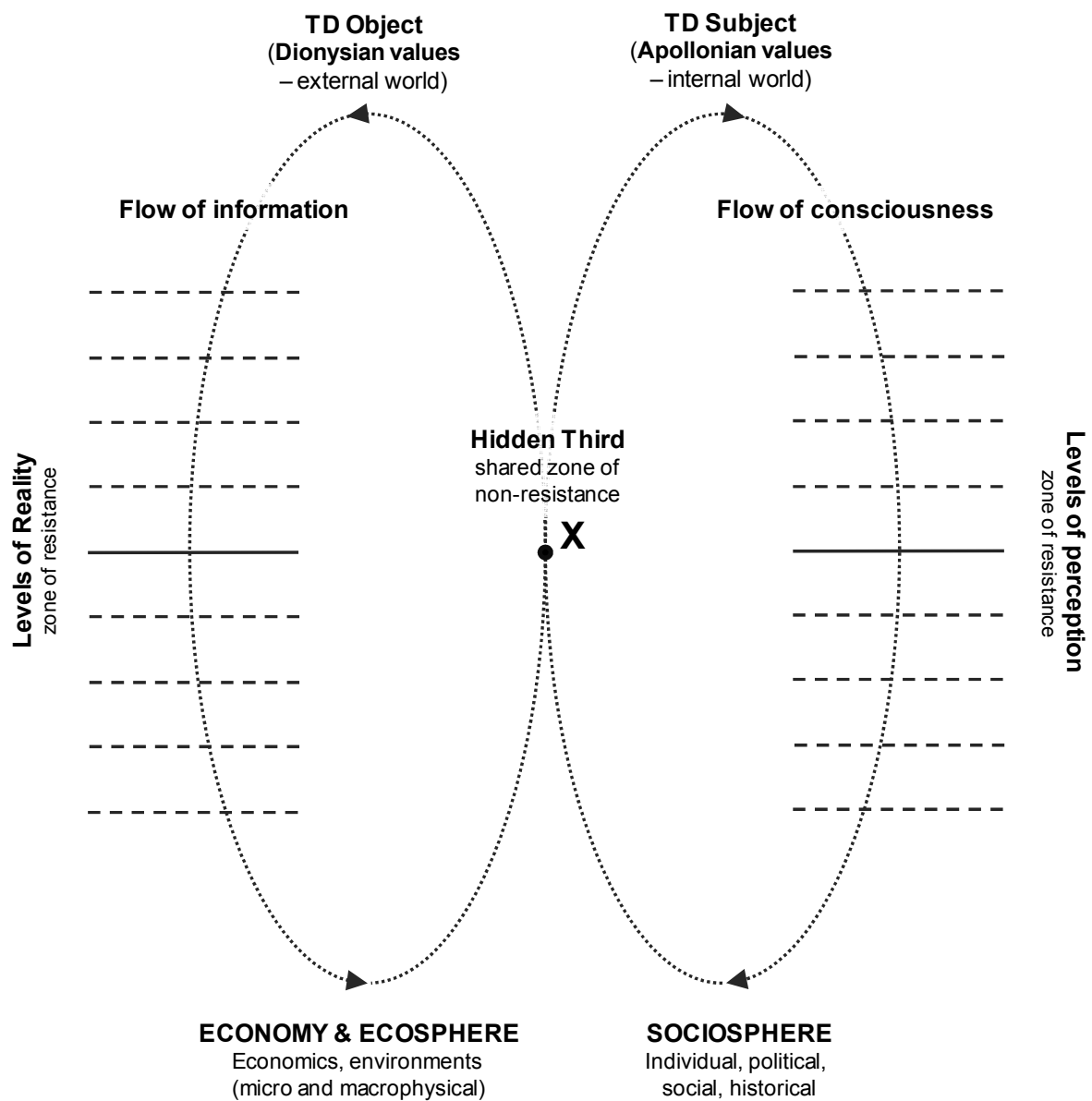
Source: Adapted from: Nicolescu, B. (2002). Manifesto of Transdisciplinarity, pp. 155.

Levels of Reality refer to a group of systems which are invariant under certain laws. Two levels of Reality are different, if there is a break in the laws and a break in fundamental concepts (like, for example, causality). Historically, the existence of different levels of Reality has been affirmed by different traditions and civilizations. The discontinuity that is manifested in the quantum world is also manifested in the structure of the levels of Reality (Nicolescu, 2005). Every level associates space and time (van Breda, 2008).

The unity of levels of perception and the complementary zone of nonresistance constitute the TD Subject (Nicolescu, 2002). It gives the meaning to the physical elements of TD Object, the meaning from individual, political, social, historical point of view (McGregor, 2011). TD Subject develops

human relations and relationships towards TD Object. In terms of SD, TD Subject symbolize sociosphere comprising philosophy, psychology, anthropology, humanistic, etc. The role of SD is to provide new meaning to TD Object and to human activities. The human inner world (Conditions), where consciousness flows, is the source of tolerance, justice and other Apollonian values. It is the source of desired changes towards TD SD. TD Object and TD Subject are non-separable and dependent on each other, with other words, they restrict and modify each other.

Different levels of Reality are accessible to human knowledge thanks to the existence of different levels of perception, described diagrammatically at the right side of the Figure 2. They are found in a one-to-one correspondence with levels of Reality (Nicolescu, 2002). New levels of perception can be activated as a consequence of different states of consciousness induced by our physical structures and our sensorial organs. Higher consciousness can be reached by training thought patterns (TD Subject) and simultaneously through feedback impulses from the individual or collective experiences in given Circumstances (TD Object) that affect the state of consciousness.

The flow of consciousness and the flow of information insure the coherent transmission of information and consciousness and enable "uncovering" new levels of Reality and thus reaching new knowledge. They meet in a point called Hidden Third where its mediating mechanism makes it possible to unify knowledge necessary for developing holistic sustainable future. It is the source of Reality and perception and at the same time represents connection between outer and inner world. People's experiences, interpretations, descriptions, representations, images, and mathematical formulations meet there in the form of TD Reality (Nicolescu, 2002). Hidden third is probably not fully achievable but may be approached by awakening consciousness.

The two flows are interrelated because they share the same Hidden Third point in the zone of nonresistance (see Figure 2). In the zone of nonresistance there are no levels of Reality and no levels of perception. The nonresistance of this zone of absolute transparence is due to the limitations of our bodies and of our sense organs. The zone of nonresistance corresponds to the sacred – to that which does not submit to any rationalization (Nicolescu, 2002). The zone of non-resistance plays the role of the included middle, which allows the unification of the TD Subject and the TD Object while preserving their differences. Moreover, Apollonian and Dionysian values meet here and enable people to grow in terms of Apollonian values. Without mediating role of the Hidden Third, it would not be able to integrate perspectives from different realities, e.g. economics and humanistic.

When people overcome their resistance to differences or contradictions, it consequently lets them to cross levels of perception and to realize new levels of Reality (laws and fundamental concepts). The Hidden Third inherently lets people release their aspects of how they currently see the world; it is a place where people become open to other perspectives, ideologies, human values and belief systems. Cole (2006, pp. 13) understands Hidden Third as transition zone which "involves a breakdown in the laws and logics that hold in the person's perception of Reality".

3.1.1. The Logic of Included Middle

The logic of included middle explains how levels of Reality/perception can be crossed. Two neighbouring levels of Reality in Figure 3 (NR_0 and NR_1) are connected by the logic of included middle, a new logic as compared with classical logic.

Figure 3: Symbolic representation of the action of the included middle logic
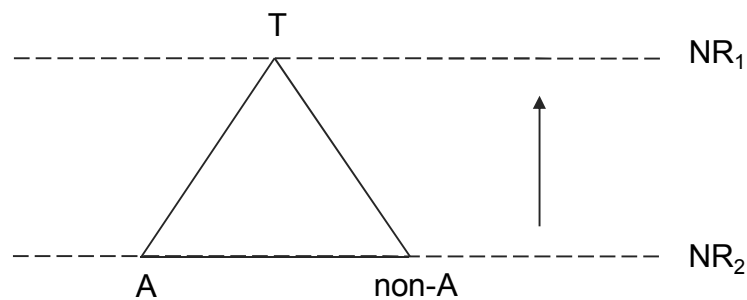
Source: Nicolescu, B. (2002). Manifesto of Transdisciplinarity, pp. 156.

The axiom of the included middle logic (Nicolescu, 2002): there exists a third term T which is at the same time A and non-A.

Figure 3 presents the three terms of the new logic, i.e. A, non-A, and T; it presents also the dynamics associated with them. T term is situated at one level of Reality, other two corners (at the bottom) are located at another level of Reality. The included middle is actually the included third (T term). If one insist on a single level of Reality, all manifestations appear as a struggle between two contradictory elements (A, non-A). The third dynamic element (T term) accomplishes reconciliation between the two contradictory elements (Nicolescu, 2002). With other words, at the individual level each individuum has opportunity to use two ears (A, non-A), but only one tongue (T term).

People usually attach to a particular conflict (problem) and forget about a cause, i.e. underlying contradiction. Thereby a conflict is nurtured over time. A conflict arises, when artificially insisting on one and the same level of Reality. To realize another level of Reality, one has to give up an attachment to existent level of Reality and "prepare space" for new Reality. The ability to overcome attachment to one and the same level of Reality (e.g. to the SD conflicts) is a prerequisite for moving toward TD SD. Society has created SD conflicts (chronic SD contradictions), because it has been unable to solve underlying contradictions. "Green reformism" is a typical example of how to put SD in such a conflict position.

No level of Reality constitutes a privileged place from which one is able to understand all the other levels of Reality (Nicolescu, 2010b). Logic of included middle does not exclude the logic of the excluded middle; it just limits its boundaries and range of influence. Both logics are complementary (Max-Neef, 2005). Figuratively, between black and white colors (two extremes) there are present all other colors with their hues and they are just as important as black and white. The logic of included

middle enables to see colorful world and not just dull black and white part of it. It prevents temptation to go from one extreme to another and at the same time provides wide palette of possible, more balanced choices. Such attitude encourages individual's freedom in the sense that one can express her/his opinion and at the same time respect opinion of the others.

3.1.2. Human Values

TD human values are composed of Apollonian and Dionysian values. The latter correspond to the TD Object, while Apollonian values correspond to the TD Subject. Dionysian values ignore Apollonian values, but not vice versa. Apollonian values rather give Dionysian values a new meaning. Various ways of thinking (logics) consistent to specific values are presented in Table 1.

Table 1: Dionysian and Apollonian values in relation to different logics

Dionysian values (values of power & hedonistic values)	Apollonian values (fulfillment & moral values)
Binary logic (either true or false)	Quantum logic
Linear logic	Nonlinear logic
Reductionistic logic (focus on the flow of information)	Non-reductionistic logic - holism (focus on the flow of consciousness)
Law of excluded middle (Classical or Aristotelian logic)	Logic of included middle

Crisis of human perception of the common good is due to the lack of Apollonian values. Apollonian values at elementary-individual level go beyond myopia, stereotypes and ignorance. Each individuum is left to herself/himself and has right to choose personal beliefs. People opt for Dionysian values because systems Circumstances rewards them. How to change current reward system towards Apollonian values? This question could be answered by encouraging TD integration endeavors at organizational level.

3.2. Organizational-Institutional Level – the TD S-O-S Model

Most of the academic disciplines consider only one level of Reality (Nicolscu, 2002). Due to classical (linear) logic, they accept a certain Reality as being ultimate truth. Academic disciplines with different laws, concepts and human values are located on different levels of Realities. The passage from one level of Reality to another is insured by the logic of included middle. Accordingly, to use knowledge from different levels of Reality, one has to give a new meaning to a disciplinary knowledge in accordance with the common aim of a certain project. TD ontology presumes that every level of TD Reality is characterized by incompleteness, because the laws governing one level are just a part of the totality of laws governing all levels (Nicolescu 2005). There exist no hierarchy between the disciplines and no discipline could be superior over others. SD policy should not exclude, but rather include different spectrums of academic disciplines from

economy, sociosphere, and ecosphere. The balanced prominence of these areas can ensure a balanced development.

By itself every discipline has its own content, but no meaning. Certain discipline gets its meaning only by establishing relations and relationships with other disciplines. As Boulding points out: "somewhere between the specific that has no meaning, and the general (all disciplines as one discipline) that has no content, there must be an optimum degree of generality" (Boulding, 1956). It is context (problem, goal) dependent, which and how many disciplines are involved in implementation of a certain project.

The TD knowledge corresponds to a new type of knowledge – "IN VIVO"[8] knowledge. This new knowledge is concerned with the correspondence between the outer world of the TD Object and the inner world of the TD Subject. By definition, the TD knowledge implies the impossibility of a self-enclosed complete knowledge (Nicolescu, 2005). Taking into account the logic of included middle, the reconciliation between two or more contradictory disciplines creates a new temporary T term (see Figure 3), which represents the emergence of new non-disciplinary insights (TD knowledge). Bur there exist only temporary reconciliation (no final T term) of any contradictions or antagonisms between A and non-A (Cole, 2006). The process of reconciliation is consequently never ending. TD knowledge has no final truth; it is rather evolving and always unifying disciplinary knowledge. Reality is dynamic, it is impossible to arrive at an exact and complete point of Reality (Nicolescu, 2010a).

Every institution or organization should observe its Circumstances and Conditions from within (TD Subject) and from outside (TD Object), since diversity of views allows a better understanding of a system in which they operate. The so-called TD S-O-S model (see Figure 4) shows two TD Subjects sharing the same TD Object from different levels of perception. The model considers TD Subject as a source of collective flow of consciousness and human values in an organization or institution. TD Object represents a source of information and projected collective levels of Reality that share the same concepts, ideologies, problems, etc.

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[8] "IN VIVO" – (Latin "within the living") Corresponds to strong TD integration that takes into consideration different stakeholders, complexity, Apollonian values, TD Subject, and adopts systems thinking approach, etc. In biology, "IN VIVO" refers to experimentation using a whole, living organism as opposed to a partial or dead organism ("IN VITRO" - Latin "within glass"- controlled environment, e.g. laboratory, test tube). "IN VIVO" testing is employed over "IN VITRO" because it is better suited for observing the overall effects of an experiment on a living subject (Perkel, 2007)

Figure 4: TD S-O-S model
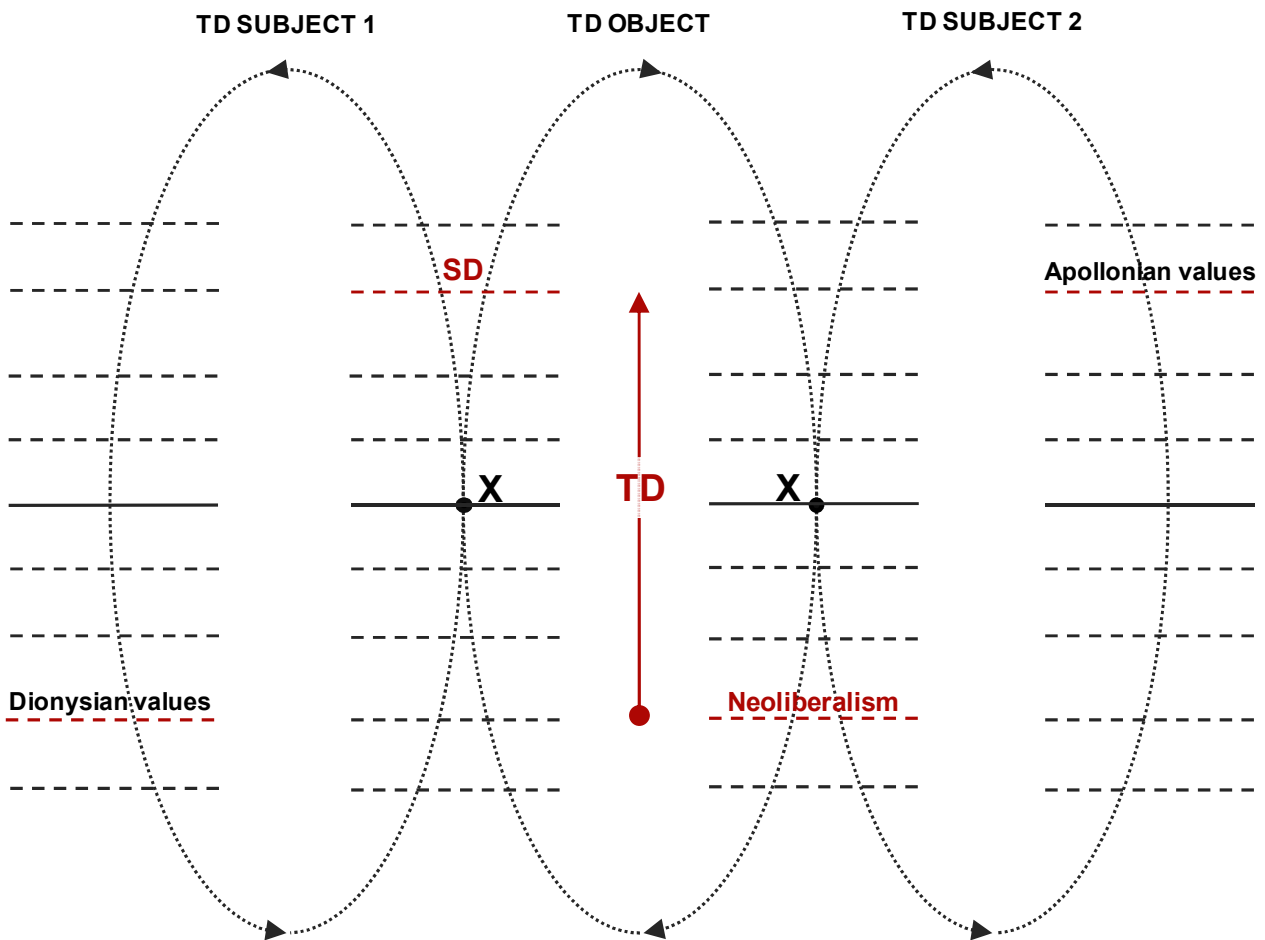
Only an organization or an institution with Apollonian values is able to overcome conflicts and contradictions with a help of the logic of included middle. Organizations with Dionysian values create conflicts by using the law of excluded middle, while they are not ready to accept new perceptions. When the theory of different levels of Reality and its associated logic of the included middle is understood, the Conditions are established for developing integrated SD Circumstances, under which TD SD vision and knowledge can be developed. Overriding principle is not to separate the opposing poles from the many bi-polar relations that characterize the behavior of nature and of social life. Such a separation is normal for rational thinking and its correspondent linear logic. Artificially simplifying our knowledge about relations and relationships between humans and nature creates increasing disfunctions of eco-systems and its social and economic subsystems (Max-Neef, 2005). The results of such rational thinking are even bigger tensions within and between organizations, i.e. non-cooperation, corruption, cost externalization, destruction of common good, violence, isolation, lack of vision and meaning of operation, etc.

TD means to reach out beyond science and also to include aspects of empirical/practical contexts. Due to TD logic no part can be self-sufficient by itself; all of the parts are interrelated and on a generalized level share a common meaning. The only sustainable system is the holistic system in all of its dimensions and particles. TD ontology encourages people to seek multiple perspectives on

any set of human problems. Key for successful TD cooperation at organizational-institutional level is integration of also non-academic actors at an early stage of a project, i.e. at goal setting (Muhar et al., 2006). Accordingly, people in charge of TD projects must be able to interact with civil society, local community leaders, colleagues, partners and stakeholders from diverse backgrounds. Such projects demand cutting across the institutional borders of academia, civil society, and government. Communication with societal actors facilitates identification of relevant research questions and also implementation of solutions (Baumgärtner et al., 2008, pp. 387). The unity of different levels of Reality leads humanity closer to a holistic sustainable wellbeing, without passing through devastating conflicts, but by passing through the Hidden Third.

Ethics is the basis of SD, but not of neoliberal capitalism that creates Circumstances favorable to implement Dionysian values. Such Circumstances encourage fictitious SD. TD organizations demonstrate Apollonian values and therefore cooperate also with organizations possessing only Dionysian values. A strong feature of TD organizations is that they are positive and optimistic, but not naive. They give a true reflection to Dionysian organizations which are in deep illusion of never-ending growth in turnover and profit. Eventually, behavior of any organization is much dependent on the national-global system's Conditions and Circumstances in which they operate.

### 3.3. The TD O-S-O Model at National – Global Level

Due to globalization we are witnessing the expansion of a uniform global concept of neo-liberal economic and political mindsets based on Dionysian values. Apollonian values are rare, especially in the world of elites who manage the common good. Even custodians of morality (religions) are not resistant to penetration of Dionysian values. Inertness of corporate leaders towards socio-economic transformations is due to their infatuation in Dionysian values. They do not want to lose their benefits and privileges that enables them neoliberal capitalism. Circumstances and Conditions at organizational and elementary level are dictated by Conditions at national-global level. Today's global socio-economic-environmental crises are trying to be solved by establishing the primary state that existed before the crises had occurred. In fact, the primary state cannot be established and such an approach reflects an absence of vision. Inherently, crises are leading to transformations of the Conditions and Circumstances and opening "space" for a new global order. SD contradictions are natural consequence of a transformational process of the TD Subject and TD Object in a cyber, space and time. They require adaptation of the TD Subject to new complex Circumstances with transformation of ways of thinking (to the logic of included middle) and values (to Apollonian values).

It seems, that current mainstream "green reformism" is focused more or less on solutions related to the TD Object (technology and natural resource management) while ignoring the TD Subject. But without TD Subject there is no flow of consciousness. In Circumstances, where the TD Subject has equal role as TD Object, there is much bigger probability for a new knowledge breakthrough and for finding intelligent and intuitive solutions to complex global SD problems. Current "green reformism" attempts to solve polycrises from the same level of Reality as the problems were created. An awareness of discontinuity of this level is required.

Figure 5 illustrates the so-called TD O-S-O conceptual model which may constitute a "counterbalance" to the circular flow model (see Figure 1) that forms the centerpiece of the mainstream economic view of SD. The model highlights necessary national-global Condition and Circumstances to approach holistic TD SD based on Apollonian values. The TD O-S-O model shows TD Subject (sociosphere) perceiving two TD Objects (economy and ecosphere) from different levels of perception. TD Subject is here presented as sociosphere, through which flows the collective national-global consciousness.

To approach TD SD the following Conditions and Circumstances have to be met. Firstly, awareness of the need for discontinuity of the current destructive human behavior develops new collective perception of human relations and relationships towards Apollonian values. Secondly, when the level of perception with Apollonian values is recognized, Conditions are suitable for "IN VIVO" TD integration. Thirdly, based on such Conditions and Circumstances new non-reductionist vision of economic development can be created (TD SD vision). "Green reformism" succeeded only partially to achieve TD SD goals as the Conditions and Circumstances have remained broadly unchanged.

Figure 5: TD O-S-O model
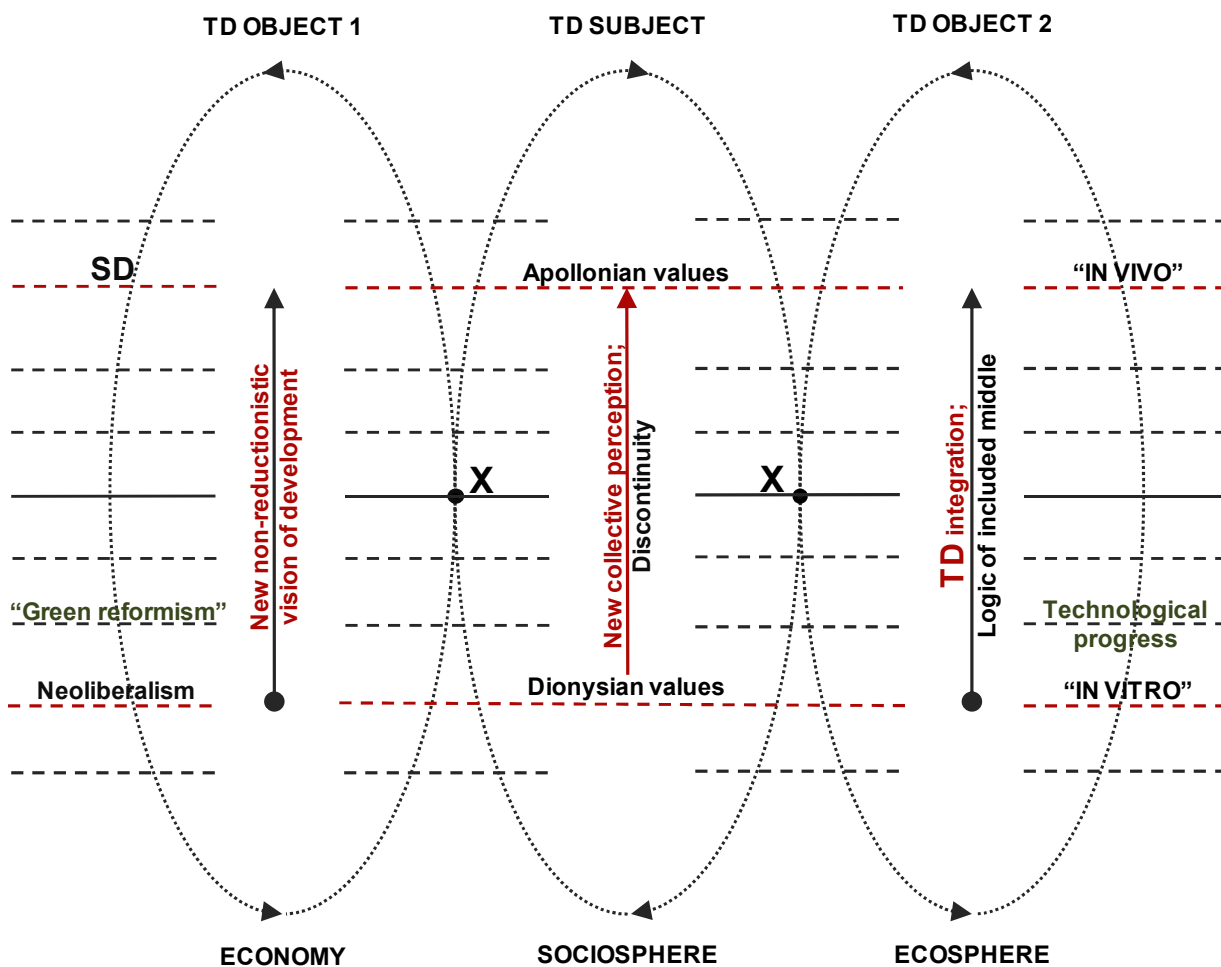
TD SD endeavors at global level needs to develop a common concept and vision from the same unifying Apollonian level of perception. This requires a long way of solving conflicts and contradictions. Reconciliation can be achieved through changing of levels of perception (human values) in order to pursue a common good (goal). Different nations cannot have the same content, but they can share the same meaning. TD approach integrates different contents under a common meaning within a specific common goal (to crate TD SD world). The TD O-S-O model does not represent upgrades of the existing defective non-visionary circular SD model, but opens up a new intellectual space, where the probability of finding global "IN VIVO" socio-political solutions is far greater. To develop new global socio-economic structures is the challenge of future "IN VIVO" TD endeavors, which is possible only with a help of influential critical mass of people with Apollonian values.

4. CONCLUSION

TD SD underpins Apollonian values such as interdependence, empathy, equity, personal responsibility and intergenerational justice. These human values are the only foundation upon which any feasible vision of sustainable world can be constructed. Disciplinary research concerns one and the same level of Reality or even fragments of one level of Reality. In current era, one can notice predominance of misplaced beliefs such as reductionism, binary – linear logic and disciplinarity. TD does not oppose them; it rather gives them a new meaning.

TD approach integrates different disciplinary contents under a common meaning within a specific common goal. Resulting holistic and unified knowledge can cope with complex global SD problems. Nowadays, Conditions and Circumstances at all levels of social integration are not in favor of TD SD. Therefore, it cannot be expected that partial SD solutions are going to be effective. Systems problems can only be solved with systems solutions and these solutions claim fundamental changes. In the first phase awareness of discontinuity of current destructive human behavior is required. Thereafter, it is necessary to establish Conditions and Circumstances for the TD integration of academic disciplines and civil society. Eventually, with a help of the logic of included middle new non-reductionist vision of human development could be developed.

Contradictions are incompatible and at the same time inseparable, but they are surmountable by the logic of included middle. Reality depends on us, it is created but not given, and our responsibility is to build sustainable future in accordance with Apollonian values.

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HIGHLIGHTS:

- Based on the concept of transdisciplinarity new sustainable development models are proposed at three levels of social integration.
- The models introduce necessary conditions and circumstances for developing and implementing holistic sustainable development vision and goals.
- Before focusing on specific sustainable development systems solutions, transdisciplinary conditions and circumstances have to be met.

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