SUSTAINABLE DEVELOPMENT & DIVERSITY: REFLECTIONS ON KNOWLEDGE, CULTURAL DIVERSITY AND ENVIRONMENTAL SUSTAINABILITY FROM A TRANSDISCIPLINARY PERSPECTIVE

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Abstract: In our rapidly globalizing world, continuous readjustment of the scientific basis of sustainable development (SD) is a prerequisite for sustainability. We shed light on the shift in international discourse concerning cultural diversity and SD. We analyse worldviews as a constitutive element of SD, proposing to re-interpret SD as a joint worldview-construct in progress, embracing a multiplicity of visions and knowledge. Through critical literature review, we identified transdisciplinarity, co-creation of knowledge and intra-/inter-cultural dialogue as a necessity for SD to retain its "universal" appeal. Transversal thinking, biocultural diversity and trends within SD research act as a guide throughout our reflection on knowledge-creation for and interpretation of SD, starting from a worldviews perspective and interdisciplinarity.

Keywords: sustainable development, sustainability, diversity, worldviews, knowledge, interdisciplinarity, transdisciplinarity, science for sustainable development

1 Introduction

Sustainable development (SD) is a hard to define concept. Attempts towards exact definitions of SD fail repeatedly because of invocation of normativity, contextual values and priorities. The enormous complexity of interwoven socio-ecological (sub)systems does not ease the job. Attempts to interpret SD and to translate it into decisions and actions are hampered by these complexities. 'plus c’est la même chose, plus ça change.' This converse of the French aphorism (Bateson 1972: 440) seems to be the more exact definition of biological, ecological and social cybernetic and homeostatic systems.1 We interpret this phenomenon of spread of change as a learning process and a guide throughout our argumentation. A static interpretation of SD and purely mono-disciplinary attempts to address sustainability related issues are not compatible anymore with the growing complexity of the socio-cultural dynamics through which SD is being shaped and the resilience of transforming ecosystems that has to be optimised. Transitions towards sustainable aim at the same kind of dynamics, a world that is constantly transforming and evolving.2

The growing knowledge of socio-ecological systems, their mutual interactions and interconnections, feedback loops and circuits demands as well a continuous readjustment of the scientific basis of SD. In interpreting SD we can not opt for a purely scientific study of ‘matter’ any longer. We have to integrate other forms of knowledge (e.g. local knowledge) and keep in mind the discursive political-ecology that eventually interprets data and that constructs solutions, priorities and perceived risks in the scope of SD. (Dove & Carpenter 2008: 321-422). In a world confronted with growing uncertainty and complexity - fed by rising globalisation and (super-) diversification - stakes are high and decisions become more then urgent. (Ravetz 1999). (See also Figure 1 on ecosystem unpredictability)3 Synergies have to take place and multiple legitimate viewpoints – from a wide variety of disciplines – have to collaborate in order to make accurate decisions and action possible to address the problems of our world today. The inherent normative character does not ease the future of SD in a context of complexity and uncertainty. Further on in this paper, this normativity will lead us to scrutinize the ‘pretentious’ ambition of SD as a universally desirable goal or pursued “state-of-being”. Interdisciplinarity – or as we argue later on in this paper transdisciplinarity – might give an interesting outcome and important component for the scientific challenge of coupling the cybernetic systems of the individual human organism, the human society and the larger ecosystem. As Bateson (1972) argues, also consciousness will play a major part in enabling us to do so. Guattari (1989) – in his theory of ‘three ecologies’ (societal, natural and psychological) - points out the need to bridge disciplines and systems to address the environmental and sustainability related crises (confronting us in an ever more urgent way today) by learning to think transversally (see § 2.3).

In this paper – based on critical literature review - we shed light on three major topics related to SD, its diversities and its knowledge needs. First, we reflect on sustainability and diversity from a cultural perspective by addressing three focal points: cultural diversity (CD), worldviews and the eco-sophical concept of transversality. (Guattari 1989) Second, we elaborate on both cultural and biological diversity (BD) as constitutive elements of SD, linked by the concept of knowledge. This biocultural diversity (Haverkort & Rist 2007) will serve as a shifting point towards the core of this paper, being interdisciplinarity, knowledge and SD. Third, we continue our argumentation on SD as a knowledge-based concept by having a look at recent trends and evolutions within sustainability research - as science for SD - and what insights have been gained in these academic fields regarding interdisciplinarity. By interpreting SD through these perspectives, we identify challenges for and recommendations on interdisciplinary sustainability research and SD as a knowledge-based concept.

2 Sustainable Development and its Diversity of Visions

During the 1980’s there was a shift in thinking about the economics of development. The earlier centrality of economic growth (increases in real GDP per head) was replaced by broader notions. Development was approached more as a human-centered rather than a commodity-centered process. Important contributors to this paradigm shift are the UNDP’s Human Development Reports – starting in 1991 – and the writings of economist Amartya Sen, characterizing development as ‘human capability expansion’, including access to cultural resources and cultural preferences.

1 A constancy of some variable is maintained by changing other variables. (Bateson 1972: 441)
2 We refer to the dynamism principle of SD: the idea of SD as process of directed change or an ongoing evolutionary process, and not as a defined end-state. (Laforet & Meadowcroft 2000)
3 The non-linearity of complex dissipative systems, which occurs when they are far from equilibrium, makes the potential fluctuations unpredictable. (Prigogine and Stengers 1984 as Weyns 1998)
cultural participation. The importance of culture in the development scenario was brought forward by the World Commission on Culture and Development (‘the Perez de Cuellar Commission’), resulting in the report ‘Our Creative diversity’ in 1994. The Commission suggested that culture was out of the periphery of development studies, by pointing out the substantial cultural dimensions of a human-centered development paradigm. UNESCO elaborated these ideas in its ‘Universal Declaration on Cultural Diversity’. (UNESCO 2002)4 It clarified the importance of CD: ‘As a source of exchange, innovation and creativity, cultural diversity is as necessary as humankind as biodiversity is for nature. In this sense, it is the common heritage of humanity and should be recognized and affirmed for the benefit of present and future generations.’ (art. 1) Putting CD forward as a crucial factor for development because it widens the range of options open to everyone: ‘it is one of the roots of development, understood not simply in terms of economic growth, but also as a means to achieve a more satisfactory intellectual, emotional, moral and spiritual existence’ (art. 4). UNESCO looks at CD as the key to sustainable human development, emphasizing that ‘Market forces alone cannot guarantee the preservation and promotion of cultural diversity; … (art. 1) The Declaration does not put CD above human rights guaranteed by international law, for not ending up in a situation of ‘absolute relativism’. But it sees CD as an adaptive, survival-related process, as a ‘living, and thus renewable treasure’ and therefore it should not be perceived as unchanging heritage but as ‘a process guaranteeing the survival of humanity’. (UNESCO 2002: preface) By seeing diversity as a living process, it tackles static, essentialist and reductionist approaches of the cultural concept. The 2002 declaration views ‘indigenous knowledge’ also as such an adaptive and survival-related process, involving intra-community examination of knowledge. (McKee 2008) The UNESCO reports on CD expressed the need to promote awareness among policy- and decision-makers about the benefits of intercultural and interfaith dialogue, while bearing in mind its potential instrumentalization.5

Arjun Appadurai stated that CD guarantees sustainability, because it connects universal development goals with attainable and specific moral perceptions. (UNESCO – UNEP 2002) Long-term biodiversity always depends on maximum diversity of this kind of moral visions. ‘If human diversity decreases, as a consequence also the archive of visions – that connects moral management of nature with ‘material’ well-being – declines. Both these diversities constitute the best available resistance to ideological and technological uniformity. CD means more than pure differences in culture. It is a value that recognizes differences in people as a part of systems and relations. It unites values like creativity, dignity and community. Without these ‘cultural’ values no single sustainable perspective on development is possible, because it will not be based on the moral dedication of the executers. (Appadurai 2003)

One of the main concerns and criticisms on SD today is the dominance of economic conceptions, identifying them as particularly problematic for sustainability. (Gottlieb 1996, Bell & Morse 2010) The dimension of culture and its definition is often narrowed down (e.g. heritage, arts, …) and by doing so made irrelevant for the wider development discourse. Nurse (2006) calls to reflect on the impact on sustainability by the mode of development thinking that puts emphasis on ‘growth-oriented industrialization’ or ‘profit-driven production’ and he points at the growing diffusion of consumerism.6 These critiques call for an alternative framework for SD, of particular importance for developing countries. By giving culture a more central role in the SD paradigm, as an alternative framework, it allows for much greater diversity in policy choices ‘… what is proposed is a non-deterministic approach that breaks out of progressivist, universalistic and dependency-creating development thinking and promotes self-reliance, social justice and ecological balance. (Nurse 2006: 38)’ (See chapter 3 and Havercort & Rist 2007, Havercort & Reijntjes 2007 on biocultural diversity and endogenous development)

In the next subchapter we will elaborate on one particular aspect of CD in the scope of SD, being worldviews. We propose a re-interpretation of SD as a joint worldview-construction in progress, embracing a plurality of visions (and knowledge). Interdisciplinary will play a significant role for SD’s potential as a worldviews-construct through inter- and intra-cultural collaboration and identification of shared goals, focusing on inherent heterogeneity (see §2.3).

2.1 Worldviews and SD

Worldviews – as one particular aspect of CD - are defined as a combination of a person’s value orientation and his or her view on how to understand the world and the capabilities it offers. They are the lens through which the world is seen. (van Emgmond & de Vries 2011: 855) The kind of (often unconscious) mental habits, frames and assumptions of which worldviews are composed, might not immediately seem to be relevant to contributors of the SD debate, but exactly these kind of cultural mechanisms or ‘filters’ are the basis on which humans decide how to act, according to their perception of the environment and reality. (Weyns 1998) It shapes their beliefs in nature and in the world-as-a-whole. (Schlitz, Viiten and Miller 2010) Worldviews are perceived as cognitive, perceptual, and affective maps that people continuously use to orient and explain the world, and from which they evaluate, act and put forward prognosis and visions on the future – and as a consequence on sustainability related issues.7 (van Emgmond & de Vries 2011) Our answers on ‘ethical’ questions concerning humanity as a whole (e.g. sustainability) depend on our worldview. Indeed our personal worldviews truly matter and influence our suggested political solutions. (Apotell 2002) Worldviews are complex, heterogeneous and unequally developed, as people are unequally informed. The possibility of completely describing perfectly balanced worldviews is excluded by this diversity in their construction. Scientists should be utterly aware of the underlying heterogeneity of worldviews. Following worldviews theories, SD will not be interpreted everywhere in the same way or might even not be workable in some places at all. Therefore the actual interest for the sustainability researcher lies in what people working towards SD think SD is – what they call SD. (Lafferty & Meadowcroft 2000)

As worldviews are unfinished, this dynamic incorporates the possibility of change and amelioration of our personal view on the world. (van Emgmond and de Vries 2011: 862) Therefore we suggest the re-interpretation of SD as a joint worldview-construction in progress. (Van Opstal & Hugé 2013) Worldview construction is collective work that is not identifiable with only one individual person, but tries to connect shared goals - or in the scope of SD a sustainable worldview - with acceptable and

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5 The insight that culture can never be reduced to the inferior position of an instrument for economic, ecological and social parameters, but largely ignored important cultural bottlenecks. According to UNESCO a change of strategy was an absolute need. CD had to gain a central role within all SD negotiations. Therefore UNESCO created its ‘Universal Declaration on Cultural Diversity’. (UNESCO 2002)

6 See also Igne & Brockington 2007 and Igne, Sullivan & Brockington 2009 on green capitalism, market environmentalism and neoliberal conservation.

7 Haverkort and Reijntjes (2007: 431) apply worldviews to environmental issues: ‘Worldview: (or cosmovision) the way a certain population perceives the world (or cosmos). It includes assumed relationships between the human world, the natural world and the spiritual world. It describes the perceived role of supernatural powers, the relationship between humans and nature, and the way natural processes take place. It embodies the premises on which people operate themselves, and determines the moral and scientific basis for intervention in nature.’

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A D A L T A  J O U R N A L O F I N T E R D I S C I P L I N A R Y R E S E A R C H  - page 39 -
specific views of these individuals or the social groups they are living in. The definition of SD proposed by the Brundtland Commission (WCED 1987) as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' is the most widely accepted and frequently cited one. As such, it will continue to serve as the guide toward future 'sustainability'. Jepson Jr. (2004) raises the potentially problematic character of this definition, because of the use of many 'undefined' terms (neither interpretation of these terms is inherent with the definition itself). 'This definition raises as many questions as it answers. (Jepson Jr. 2004: 6) On the other hand, it is left as a concept that is open to interpretation and to the integration of different perspectives / worldviews. Interpretive flexibility (Van Opstal & Hugó 2013) can be of special interest for SD, as it has to be applied and implemented according to specific problems and in particular (locally) varying contexts. Variation in the interpretation of the sustainability concept 'allows for a multitude of actors, possibly the whole of society, to be involved, encouraging local solutions'. (Kemp & Martens 2007) In other words it allows different worldviews to identify shared goals and co-evolve - through joint worldviews construction – towards co-produced interpretations of SD that can generate sustainable transformations of all worldviews. As a person’s worldview transforms, awareness can expand leading to enhanced ‘prosocial’ experiences and behaviour. Increased social consciousness can in turn stimulate further transformations in worldview towards sustainability. (Schlitz, Viten & Miller 2010)

2.2 Interdisciplinarity from a Worldviews & Transversal Perspective

Apostel (2002) stated 4 major motivations for interdisciplinarity starting from a worldviews perspective. Science is subdivided into disciplines, but reality itself is not. Secondly, almost everyone has a psychological need to integrate their experience and perception of nature and culture into a worldview or a total view. This counts for laymen as well as scientists. Thirdly, environmental (cf. sustainability) issues are extremely complex and constitutively transboundary. A fourth motivation is an evolving relationship between science and society - resulting in a trend towards applied, action-oriented science in synergy with society at large. To establish the link between science and society and to enhance this synergy (between e.g. local, indigenous & - global? - scientific forms of knowledge) we put forward the concept of interculturality as highly significant for the implementation of CD - from a worldviews perspective - in SD. Rist and Dahdouh-Guebas 2006: 473) Both authors raise three main issues that need to be addressed for an intercultural approach of knowledge. The typology reveals that no relationship between local knowledge and science can be value-free. It depends on specific ethical positions. Secondly, it implies 'the establishment of the broadest possible field of interaction between different types of knowledge. (Rist and dahdouh-Guebas 2006: 473) and a process of deliberation. An agreement on fundamental ethical principles is necessary before going into an intercultural dialogue. The will to accept the possibility that ‘the other may be right’ is a necessity. Thirdly, intercultural dialogue is better possible when all parties ‘have shared questions on fundamental aspects related to the form of knowledge they represent. (Rist and dahdouh-Guebas 2006: 474)'

Bateson and Guattari drive the link between the social and the natural, man and environment or nature and culture even further by introducing the human psyche, the mind. ‘There is an ecology of bad ideas, just as their is an ecology of weeds (Bateson 1972: 484)’ In Bateson’s attempt to outline some of the ‘epistemological fallacies’ of Western civilization, he argues that – scrutinizing Charles Darwin’s theory of natural selection – ‘the unit of survival is organism plus environment. We are learning by bitter experience that the organism which destroys its environment destroys itself. (Bateson 1972: 484)’ He arrives at the conclusion that ‘the unit of natural selection turns out these days to be identical with the unit of mind. Resulting in a different hierarchy of units: gene-in-organism, organism-in-environment, ecosystem, etc. Ecology in this broadened sense turns out to be the study of the interaction and survival of ideas and programs (e.g. differences, complexes of differences) in circuits. Felix Guattari based his ecosophy8 of the three ecologies (Guattari 1989) on this idea that nature cannot be separated from culture. Based on his theory, he states that in order to comprehend the interactions between eco-systems, the mecosphere and the social and individual ‘Universes’, we must learn to think transversally. (Guattari 1989: 29) As opposed to traditional environmentalist perspectives – according to Guattari obscurring the complexity between humans and their environment through a dualistic separation of culture and nature – we agree to resist pure holism, in the sense of emphasizing heterogeneity and diversity⁹ rather than creating unified and holistic structures.

3 Bridging Cultural and Biological Diversity

Within the perspective of this chapter, we emphasize the mutual dependence, interactions and links between both CD and biological diversity. Many cultural practices depend on specific aspects of biodiversity for their staying into existence. Their expressions – on the other hand - are meaningful constructions of biodiversity, developed, conserved and managed by cultural communities (with language and knowledge as the media of this management). UNESCO summarizes the importance of a combined sustainable approach towards CD and BD by using the word ‘knowledge’. (UNESCO 2002) Through this local cultural knowledge an immediate connection between CD and BD is handed. Koichiro Matsuurap declared in 2002 that a step forward has to be made by acknowledging diverse (cultural) views on the well-being of humanity, as essential to fully understand the environment, to protect it and to be able to fulfil the needs of present and future generations. ‘Indigenous and traditional communities all over the world developed an extra-ordinary sophisticated insight in biodiversity, the fruit of a rich basis of knowledge and a pattern of values that respects this knowledge. We can no longer ignore the knowledge that connects cultural and biological diversity.’ (WSSD 2002)

3.1 Knowledge as Bridging Factor between Diversities: Biocultural Diversity

Respect for CD and a multiplicity of visions broadens the possibilities for everyone. In combination with BD it is essential for our survival. Loss of diversity brings along an enormous loss in the quality of life. Thereby we restrict and cut down our potential knowledge of the environment and the advantages of our biosystem. Nowadays there is more consensus that the deterioration of BD as well as CD is a threat for global stability. It puts the earth and humanity in an extremely vulnerable position. The Johannesburg Declaration emphasizes that CD and BD are equally significant conditions for SD. (WSSD 2002) In the Millennium Declaration (2000), the U.N. called for respect for nature, as one of the fundamental values for humanity. Contemporary patterns of consumption and production (in developed societies) have to be changed in the interest of our future well-being and that of our relatives. Respect for BD implies respect for human diversity. CD is a source of innovation, creativity and exchange. CD does not offer an unchangeable object that has to be ‘conserved’, but it offers a framework for a continuous dialogue between all possible expressions of identity. Culture connects individual, community and humanity. CD ensures SD because it connects universal development goals with acceptable and specific moral visions.

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8 For a wider discussion see The Ecosophic Object in Chaumoose. (Guattari 1992)
9 Synthesizing assemblages and multiplicities in order to trace rhizomatic structures.
Globalization (especially fast neo-liberal globalization) create new questions and challenges. (Igoe & Brockington 2007, Igoe, Sullivan & Brockington 2009) More than a purely economic phenomenon, globalization is also a cultural, technical and ecological phenomenon. Political and legal measures have to be taken in order to help promotion of CD and BD. Based on the insight that cultural and biological phenomena can not be dissociated, actions are needed.

3.2 Knowledge for SD & Interdisciplinarity

SD should embrace a multiplicity of knowledges (scientific knowledge, local knowledge, etc.), evolving towards an active pluralization of the knowledge-concept for SD. Rist and Dahdouh-Guebas (2006: 471) argue that each form of knowledge can be scientific in nature. Indigenous knowledge is often holistic, functional and adaptive to changes in the environment. Therefore it has high potential for resilience-based ecosystem management. They state that ‘it is not the mere fact of this integration of knowledge which is challenged, the critical aspects are related to the questions on who is setting the issues for a particular disciplinary research agenda and how the findings should be re-integrated in function of a societal process oriented in the principles of SD. The roles of conventional scientific knowledge production in the context of societal processes are put under public scrutiny by the discourse of ‘scientific’ knowledge production for SD is interdisciplinarity, in order to achieve a less fragmented view on SD topics. Although it allows the integration of different scientific disciplines, the choice of issues addressed and its ontological foundations will remain exclusively ‘academic’, encompassing a lack of true participation of the involved society and communities. Thereby creating the same problems as disciplinary-based knowledge production. ‘Abuse’ of the term interdisciplinarity, as a combination of different sciences within a science field or as a compilation of different disciplines without true interaction or integration, has led to the development of newer concepts like transdisciplinarity. Rist and Dahdouh-Guebas (2006) emphasize the need for true interdisciplinarity between basic and applied sciences on the one hand, and social and human sciences on the other. They term it as ‘interscientific interdisciplinarity’10, sometimes referred to as (scientific) transdisciplinarity. They also plead for a transdisciplinary approach’ that seeks to go beyond ‘the boundaries of western scientific actors’ and aims for a more societal mode of knowledge production. It therefore includes ‘interscientific interdisciplinarity’ and different forms of traditional / local knowledge. (Hirsch Hadorn 2002) Transdisciplinarity recognizes the plurality of knowledge, worldviews and values. Major challenge is to stimulate dialogue and cooperation between heterogeneous groups, instead of imposing a single worldview as a ‘universal theory’. ‘Abuse’ of the term interdisciplinarity (see §2.2) and Guattari’s emphasis on narrative analysis and complexities of actor-institutional interactions. (Kemp and Martens 2007)’ It is an evolving process of knowledge construction (through sharing approaches) requiring deep co-operation between disciplines to arrive at a shared understanding of issues. (Blanchard & Vanderlip 2010) Individuals within teams seek to integrate concepts and methodologies and the individual researchers are based primarily in one discipline but will have familiarity with at least a second discipline. (Sumner & Tribe, 2008) Hulme and Toye (2006) say ‘knowledge communities’ instead of disciplines.

4.1 Science for SD

Today conditions like uncertainty, growing complexity, diversity and synergy are gaining importance rapidly. For better understanding the type of knowledge generation needed to implement SD, one has to keep in mind these defining features of the context in which sustainability is realized. By recognizing these contextual factors that shape SD in reality, new approaches emerged in the sustainability arena: sustainability science, Mode-2 science and post-normal science. Proponents of these ‘sciences for SD’ have opened promising avenues for addressing the shortcomings of conventional science. (Kemp & Martens 2007) Funtowicz et al. (1998) mention two key properties of complex systems: the presence of multiple sorts of uncertainty and the multiplicity of legitimate viewpoints on an issue. Convinced that conventional normal scientific methodologies are no longer effective for finding solutions of such complexity, Ravetz proposes a second-order science or post-normal science, ‘... where facts are uncertain, values in dispute, stakes high and decisions urgent’ (Ravetz 1999). Kemp & Martens (2007) speak of normal science as mode 1 science being academic, mono-disciplinary, technocratic, certain and predictive; versus sustainability science or mode 2 science being academic and social, interdisciplinary, participative, uncertain and exploratory. Sustainability science is then defined as an integrative science, which aims at the integration of different disciplines, viewpoints and knowledges. Its central elements have recently been clarified in literature: ‘Inter- and intradisciplinary research; coproduction of knowledge, a systems perspective with attention to the co-evolution of complex systems and their environments; learning-by-doing (and learning-by-using) as a basis of acquiring experience, besides learning-by-learning (learning through detached analysis); attention to system innovation and transitions. (Kemp & Martens 2007)’ Knowledge for SD needs to analyse a system’s deeper-lying structures, needs to project into the future, needs to be uncertain, cannot be identified, needs to lead to the design of new strategies for solutions. SD’s normative character and its long-term horizon result in specific demands. Knowledge for SD has to consist of: 1) diagnostic knowledge, 2) explanatory knowledge, 3) orientation knowledge, 4) knowledge for action. (Laes & Maes 2007)

4 Knowledge, Science for SD and Interdisciplinarity

The legitimacy of knowledge – for SD - depends on the process by which that knowledge is generated. Knowledge needs to be co-produced and provisional, thereby challenging ‘normal’ academic science. It demands a ‘systems’ approach, which emphasizes the primacy of the whole. Bell and Morse (2008) state that ‘a system is a perceived whole whose elements hang together in some way, continually change and operate toward a common purpose’. Any system is an intellectual construct, imposed by some humans on a set of phenomena and their explanations. The boundaries of that system do not always coincide with the actual interactions relevant to a societal problem. (Funtowicz et al. 1990) A systems approach is often compared to the contrasting reductionist approach where the well-defined problem is in the mind of the scientist and a part of a complex whole is analysed. In a systems approach, the problem is shared by legitimate stakeholders, has flexible boundaries and is reviewed as a whole to structure different sources of knowledge around a common topic. This is an evolving process of knowledge construction (through sharing approaches) requiring deep co-operation between disciplines to arrive at a shared understanding of issues. (Blanchard & Vanderlip 2010) Individuals within teams seek to integrate concepts and methodologies and the individual researchers are based primarily in one discipline but will have familiarity with at least a second discipline. (Sumner & Tribe, 2008) Hulme and Toye (2006) say ‘knowledge communities’ instead of disciplines.

10 Scientific interdisciplinarity that transcends the science field.

11 Jepson Jr. (2004) elaborates on reflexivity: sustainability science’s interdisciplinarity feature implies that disciplines not only differ in subjects and methods, but also have different worldviews. One has to transcend unconscious thinking by reflecting on personal values, interests and representations.
alternative problem framings are an essential element, vi) a level of subjectivity awareness is key.

5 Conclusion: Transdisciplinarity as InterScience for Sustainability and its Diversities

Starting from a short overview of the shift in the international institutional discourse on SD concerning cultural aspects of development and CD, we introduced worldviews as one of the constitutive elements of SD by proposing to re-interpret SD as a joint worldviews construction in progress. Thereby embracing a plurality of visions (and knowledges) on the topic. From a worldviews perspective, interdisciplinarity, collaboration, identification of shared goals and intra- / intercultural dialogue becomes a prerequisite to bring SD into effect in a vastly globalizing world confronted with (super-)diversification and growing complexity and uncertainty. Following Guattari (1989) we agreed to resist pure holism as a sole goal, in the sense of opting for emphasis on heterogeneity and diversity rather than creating unified and holistic structures. New concepts like biocultural diversity and international reports acknowledge inherent links between both BD and CD – as constitutive aspects of SD. The importance of a combined SD approach to CD and BD is summarized in the one word knowledge. Knowledge for SD requires interdisciplinarity as transdisciplinarity, embracing a multiplicity of ‘knowledges’ and knowledge systems. We propose an active pluralisation of knowledge for SD. Recent trends and insights on knowledge production for SD within academic fields of sustainability research confirm this urgent need.

As pointed out, SD’s normative character and its long-term horizon result in specific demands for science and a specific way of knowledge creation. The legitimacy of this knowledge depends on the process by which it is generated. It needs to be co-produced and provisional, by aiming at bridging epistemologies, worldviews and viewpoints that are relevant for the context in which SD has to be applied in order to generate ‘best available’ knowledge and know-how to address the sustainability issues involved. Science for SD is then defined as an integrative science, aiming at transcending and reconciling different disciplines, worldviews, viewpoints and their knowledges towards generating shared and co-produced knowledge in the scope of an integral and balanced view on sustainability. Elaborated by concepts like e.g. sustainability science, this demands for a systems approach, emphasizing the primacy of the whole and respecting heterogeneity. This requires thorough transdisciplinarity, that is not limited to the combination of different sciences within a science field or to the compilation of different disciplines without true interaction or integration. (Rist & Daudouh-Guebas 2006: 471, Blanchard & Vanderlinden 2010)13 Transdisciplinarity acknowledges that: ‘Science is part of the processes it describes and is therefore focusing on a systemic view of social and natural dynamics that are shaping the world. It also recognizes the plurality of forms of knowing, worldviews and the values connected to them within different social and cultural groups. (Scholz et al. 2000) A certain amount of subjectivity awareness and recognition of contextuality is a key element in achieving transdisciplinarity knowledge for SD. In this context we suggest broadening the definition of expertise and articulating the global and the local.

Literature:

13 It is an evolving process of knowledge construction (through the sharing of approaches) requiring deep co-operation between disciplines to arrive at a shared understanding of issues. (Blanchard & Vanderlinden 2010)
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Primary Paper Section: A

Secondary Paper Section: AA, AC, AL, EH