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## METHODOLOGICAL AND IDEOLOGICAL OPTIONS

# 3-D Sustainability: An approach for priority setting in situation of conflicting interests towards a Sustainable Development<sup>☆</sup>

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### ABSTRACT

This paper aims to provide a new approach to objectively assess hierarchies and priority setting in the relationship between environmental, social and economic sustainability within Sustainable Development. After a literature review, several widely used conceptual figures (diagrams) describing this relationship were assessed using SWOT analyses in order to identify the major weaknesses in these pictorial descriptions. Based on the findings, a new concept called '3-D Sustainability' has been developed and is presented visually as well as is described in the text. This concept introduces and ranks criteria for the assessment of hierarchies within, and conflicts of interests between, social, environmental and economic sustainability (the three dimensions of sustainability). These criteria are applied to several existing hierarchies and solutions to conflicts of interests. Based on the SWOT analyses, the main shortcomings of the widely used conceptual figures were identified as (1) misinterpretation of embeddings, (2) misjudgement of equity between the three dimensions of sustainability, (3) a lack of expression of limitations, and (4) lack of adequate decision support. These shortcomings are overcome (theoretically and in practice) by '3-D Sustainability', a slightly more complex, but conceptually richer, figure than the widely used conceptual figures assessed. In particular, the shift of the burden of proof within the three sustainability dimensions is argued as a main solution. The application of the criteria of '3-D Sustainability' to several real examples indicates its usefulness in decision support, while justifying more sustainable hierarchies and solutions in the settlement of conflicts of interests within the three sustainability dimensions.

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## 1. Introduction

Since its widely known definition in the so called Brundtland-Report of 1987<sup>1</sup>, Sustainable Development has become one of

the key terms in environmental policy (for a summary of the discussion see e.g. Dobson, 1996; Ekins, 2000, pp. 75–82; de Mooij and van den Bergh, 2002). Large international organisations have started intensively discussing the term (OECD,

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<sup>1</sup> 'Humanity has the ability to make development sustainable — to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development, 1987, p.8).

2001) and in 2002 it was the main topic of a World Summit in Johannesburg promoting sustainable development on the global political agenda.

## 2. Overview of conceptual figures

A huge number of concepts already exist pictorially describing the interrelation between social, environmental and economic sustainability. Most of them aim to explain the relationship by means of one figure. This seems to be the preferable way in order to make the sustainability concept more accessible and comprehensible to a wider public. While there is a wide consensus that social, environmental and economic sustainability are the main ingredients, there are differences of opinion about their interrelationship. Insufficiencies regularly occur in such figures, the main ones being (1) misinterpretation of embeddings, (2) misjudgement of equity between the three sustainabilities, (3) a lack of expression of limitations, and (4) a lack of adequate decision support.

- (1) Those, for example, who describe the interrelation between the economic, environmental and social dimensions of sustainability by means of a 'triple-bottom-line' advocate that '[s]ociety depends on the economy — and the economy depends on the global ecosystem...' (Elkington, 1999, p.73). However, many relationships within society do not depend on the economy, but on other motivations such as friendship or altruism. On the other hand, an economy without society is impossible. An early example for this is a prehistoric tribe that lives socially in a family system not even practising exchange with other tribes. Not long ago even in today's modern countries many subsistence farmers produced all they needed and almost all they wanted on their own. Another more recently situated example is the one provided by Daly (1995:51), whereas a wooden house can not be build without human and its handcraft (as well as — of course most basically — not without timber). Additionally for example social riots which have only social reasons (e.g. racism) could also in large cities lead within short time to a total break down of the economy. Hence, an embedding of society within the economy is not a realistic interpretation, but the economy is much more likely embedded in the society.
- (2) Others explain the relationship between the three ingredients of sustainability by means of a triangle (e.g. Munasinghe, 2001; Dyllick and Hockerts, 2002), but this figural concept wrongly indicates equity between the three sustainabilities and fails to show the embedded relationship between the three major systems (see also Weber-Blaschke et al., 2005, p. 8f; Lawn, 2006, p.14f). A similar criticism has been already applied by the Forum for the Future (2002, p.6) on the above mentioned 'triple-bottom line' concept and could also be considered valid for models presenting the three sustainabilities as spatial fully or partly separated pillars (Hinterberger and Zacherl, 2003; Mainka et al., 2005, p.24; but solely on sustainability goals see Barbier, 1987, p.104).
- (3) All of the aforementioned approaches relating the three ingredients of sustainability also lack a pictorial expression of the limitation of the environmental system. In

1987 the authors of the Brundtland-Report did not believe in absolute environmental limits in the future (but only relative ones in the present)<sup>2</sup>. However, the existence of absolute limits in the present is already widely accepted, even by institutions such as the European Union<sup>3</sup>.

- (4) This deficit is more or less dealt with by figures presenting the three sustainabilities as integrated pillars (for example EEA, 1999, p.49), but without providing sufficient information on their interrelationship. Other figures on sustainable development that explicitly include the limitations of the environmental system (e.g. Goodland et al., 1992, quoted in Harris, 2002, p.125; Daly, 1996, p.49) do not include social sustainability. Other depictions include limitations, add the social system and, in addition, show some interrelations between the environmental, social and economic systems (Martinez-Alier, 2002, p.22; Lawn, 2006, p.17), but do not provide adequate decision support as to how conflicting interests between the three dimensions of sustainability may be resolved. Several of the described depictions already include in their pictorial description institutional aspects (see Martinez-Alier, 2002, p.22; Lawn, 2006, p.14). Hence, there does not seem to be an emergent need for a separate fourth element like 'institutional sustainability', as sometimes more recently promoted (see e.g. Meadowcroft et al., 2005, p.9). Moreover, institutional aspects are not capable of influencing all factors in the ecological system (e.g. the occurrence of earthquakes, volcanic eruptions, the natural adaptation of a wild species), but might sometimes ease several of their consequences.

The aforementioned deficits in depictions concentrating on the presentation of the relationship between the environment, society and economy within Sustainable Development are, to a large extent, overcome by the new concept of '3-D Sustainability' (Mauerhofer, 2003), which is described in detail in the following sections.

## 3. 3-D Sustainability: Interpretation and distinction

The concept of 3-D Sustainability can be represented by a cone with the following features (Fig. 1):

1. The base is horizontal with environmental, social and economic capital represented by concentric rings. The

<sup>2</sup> The concept of sustainable development does imply limits — not absolute limits but limitations imposed by the present state of technology and social organisation on environmental resources and by the ability of the biosphere to absorb the affects of human activities. But technology and social organisation can be both managed and improved to make way of a new aera of economic growth' (World Commission on Environment and Development, 1987, p.8).

<sup>3</sup> Points 22 and 28 of the preamble of the 6th Environmental Action Programme: '(22) Soil is a finite resource that is under environmental pressure... (28) There is a limited capacity of the planet to meet the increasing demand for resources and to absorb the emissions and waste resulting from their use and there is evidence that the existing demand exceeds the carrying capacity of the environment in several cases.' (European Union, 2002).

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