

## Conference proceedings

# Social capital, capacity and carrying capacity: exploring basics of 'socially sustainable economic degrowth'

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**2nd Conference  
on Economic  
Degrowth  
For Ecological Sustainability  
and Social Equity**

**BARCELONA  
26th-29th March 2010**





## Abstract

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In order to contribute to basic issues for the further development of a coherent theory and practical implementation of 'socially sustainable economic degrowth', the paper aims to provide a more systematic and coherent view on 'social capital', 'social capacity' and 'social carrying capacity' under the roof of the environmental carrying capacity with regard to sustainable development in the sense of 3-D Sustainability such as described by Mauerhofer (2008).

Therefore, based on an in-depth literature review especially the relationship between social capital and human capital are assessed in more detail, the overlap between the social capacity concept and the capability concept (Sen 1987, 1999) are closer discussed and the use and meaning of social carrying capacity in science and practices is more intensively explored.

The analysis shows with regard to the distinction between social capital and human capital 'as sources rather than consequences' (Woolcock, 2001:70) that clear and wide overlaps exist and that the distinction is - especially with regard to inherited personal characteristics - rather of scientific interest than of practical usefulness in the discussion on degrowth. The term 'capacity' appears already in its meaning in different languages to be closely connected to the word 'capability' and in addition wide similarities of the two concepts of social capacity and capability when dealing with the sustainable development of the source 'social capital' are found. The analysis further shows that the term 'social carrying capacity' is hardly closer defined and used in science, although its current and especially future relevance with regard for example to future limits of population growth and restrictions on technical overload appears to be obvious.

In summary, the results of the analysis provide for each of the three basic terms assessed a variety of possible contributions to the further development of policy proposals and research priorities with regard to a 'socially sustainable economic degrowth' obeying the limits of the environmental carrying capacity such as described by 3-D Sustainability.

## Keywords

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social capacity; social carrying capacity; sustainability; sustainable development; capability; human capital

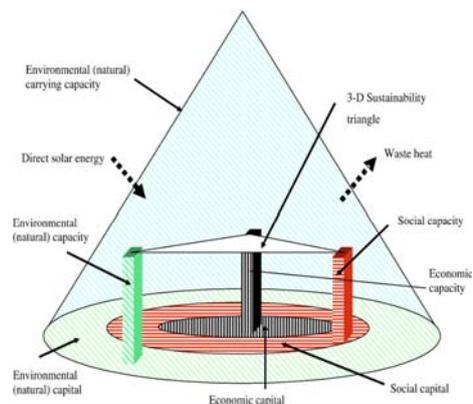
# 1 Introduction

Sustainable Development is a widely recognised and applied term since its famous definition within the 'Brundtland Report' called 'Our Common Future' launched 1987. A long discussion is still ongoing on the theoretical meaning and the practical usefulness of this concept. In the meanwhile there is wide understanding in science and practice that the social aspect contributes a significant part beside the economic part to sustainable development (see e.g. Elkington, 1999; EEA, 1999; Munasinghe, 2001; Giddings et al., 2002; Martinez-Alier, 2002; Mainka et al., 2005; Daly, 1996; Moffat, 2006; Lawn, 2006). This should not constitute a bigger surprise given the central role of needs and wants of humans within the definition cited above. However, the sustainability discussion during the first pentads appeared to mainly concentrate on environmental and economics issues while social topics played – despite the population aspects (e.g. Ehrlich et al., 1989, Ehrlich and Ehrlich, 1990) – played rather a minor part. During the last pentads, a substantial increase of research and literature occurred dealing with sustainable development from the more social point of view. Nevertheless, the social aspect of sustainability can be considered the one least explored while the environmental sustainability and economic sustainability are much further assessed (Lehtonen, 2004). Especially with regard to the research direction of degrowth some basic issues of social sustainability seem not to be conceptually assessed in depth yet.

The current paper aims to clarify some of the basic issues for the further development of a coherent theory and practical implementation of 'socially sustainable economic degrowth'. It therefore seeks to provide a more systematic and consistent view on 'social capital', 'social capacity' and 'social carrying capacity' under the roof of the environmental carrying capacity with regard to sustainable development in the sense of 3-D Sustainability such as described by Mauerhofer (2008). The relationship between these three social parts of 3-D Sustainability (all situated under the overall roof of the environmental carrying capacity) is shown in the following picture (Figs. 1 and 2).

**Fig. 1 3-D Sustainability**

Source: Adapted from Fig. 1 in Mauerhofer (2008:498)



**Fig. 2 Social capital, social capacity and social carrying capacity**

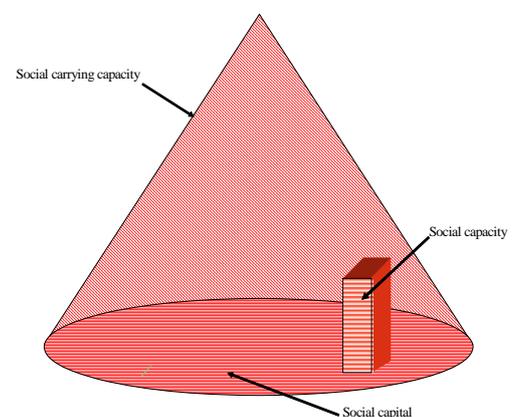


Figure 1 constitutes the concept of 3-D Sustainability but without pictorially including due to reasons of figural simplicity the social carrying capacity (Mauerhofer, 2008). Figure 2 concentrates on the social aspect of 3-D Sustainability and now – additionally to the description with Mauerhofer (2008: 499, 501 and 502) – also includes the social carrying capacity in the pictorial description.

The relationship with the other ingredients of 3-D Sustainability such as the parts of the environmental sustainability and economic sustainability are described more in detail with Mauerhofer (2008) and therefore do not form a substantial part of this current paper.

## 2 Methods

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This paper does focus solely on the three parts of the social sustainability indicated in **Fig. 2**. Based on an in-depth literature review especially the relationship between social capital and human capital are assessed in more detail, the overlap between the social capacity concept and the capability concept (Sen 1987, 1999) are closer discussed and the use and meaning of social carrying capacity in science and practices is more intensively explored. Dematerialization by increasing eco-efficiency (“better” use of natural resources). The input of resources is minimized and the input-output ratio should be changed. This approach refers to a quantitative optimization of material flows. Approaches broadly discussed include the “factor four” (von Weizsäcker et al., 1995: Higher efficiency of energy) or “factor ten” (Schmidt-Bleek, 1997: Higher global efficiency of resource input).

## 3 Social aspects of sustainable development

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Different social aspects of sustainable development have been already intensively discussed. The range starts from criticising even any attempt to extend the concept of sustainable development to areas not related to the environment and arguing that a distinct concept should be developed in order to take into account the ‘ethicosocial’ limits to growth (Daly, 1996). And it ends by providing to (sociologic) institutional aspects an own, new and fourth dimension/pillar of sustainability, beside the economic, social and environmental one’s (see e.g. Meadowcroft et al., 2005, p.9). The prior position apparently relates stronger to ethical aspects of social issues but has been criticised by Lehtonen (2004) for leaving out social considerations from sustainable development. The latter mentioned position about an additional institutional dimension of sustainability overlooks the fact that societies and their institutions are not even able to influence or deal with all naturally occurring influences such as natural ‘disasters’ and evolutionary biological changes (see Mauerhofer, 2008). Nevertheless cultural-aesthetic, religious-spiritual and political-institutional aspects have to be considered an essential part of the sustainability discussion, but should be seen as a constituent of the social dimension of sustainability.

## 4 Results

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The results are discussed in the following in five main parts. The first part is dealing with the use of social capital and human capital, especially in social science. The second part indicates a new proposal for the relationship between the social capital and human capital. The third part discusses social capital (including human capital) and social capacity, especially with regard to their current and future situation in the sustainability and degrowth discussion. The fourth part refers to main weaknesses of the capability approach (Sen, 1987 and 1999) and its overlaps with the social capacity concept. The fifth part of the results provides a definition of the term ‘social carrying capacity’ and perspectives for its future use.

## 4.1 The use of social capital and human capital

Capital in its most basic sense can be understood as a set of assets capable of generating future benefits for at least some individuals (Lachmann, 1978 cited after Ostrom, 2009). The terms 'social capital' and 'human capital' have already derived a multitude of discussion. Some authors even see 'social capital' and 'human capital' (as well as physical capital) as types of Human-Made Capital (e.g. Bartkus and Davis, 2009).

### 4.1.1 Social capital

The term 'social capital' gained especially during the last two decades considerable attention especially within social sciences but also within other fields. Ostrom (2009) pointed out that a more than 200-times (2 to 443) increase of citations in the Web of Science from 1991 to 2006. Within social science the term 'social capital' is often related to multiple social features such as wealth, power, or reputation embedded in social networks (for an overview see e.g. Lin and Erickson, 2008: 3ff). Increased social trust is in several studies shown to have positive growth effects on e.g. education, investments and initial GDP (for a literature overview see e.g. Bjørnskov, 2009: 344 as well as Durlauf and Fafchamps, 2004). A network-oriented approach has been even taken over by many studies investigating by means of various definitions if social capital affects the natural environment (see for an overview Sønderskov, 2009).

Almost as numerous as the attempts are to describe the content of social capital, are the ambitions to define the term itself. Current overviews of definitions of social capital can be found for example with Durlauf and Fafchamps (2004) and Bartkus and Davis (2009). More historical comprehensive overviews are provided e.g. with Woolcock (1998) and Putnam (2000). An overview of definitions used in studies related to environmental aspects is provided e.g. by Sønderskov (2009).

The following table strives to show only some representative efforts in the literature for such a definition (**Table 1**). Already the small selection provided in **Table 1** shows the wide difference of the use of the term social capital in the scientific literature.

Major criticism has been already put forward especially on the output-oriented use of the term 'social capital' (for an overview see e.g. Schuller et al., 2000, Harriss, 2001; Sobel, 2002:144 ff; Foley and Edwards, 1999; Robinson et al., 2002; Durlauf and Fafchamps, 2004). Some of the main counter arguments with regard to the difference between social capital and physical capital are that:

- one cannot transfer social capital from one to another (Arrow, 1999) and Sobel (2002:144) adds that this also applied to human capital as '(A)n individual need not to destroy his own human capital when he transfers it (through teaching) to someone else.'
- physical capital has a rate of return and can be readily measured by summing past investment net of depreciation (Solow, 1999)
- in contrast to physical capital, social capital appreciates with use (Ostrom, 1999)
- the equation of the existence of social capital with outcomes obtained using social capital leads to circular arguments as a successful group succeeded because it has it has social capital, but the evidence that the group has social capital is its success (Portes, 1998; echoed e.g. by Durlauf, 1999 and by Sobel, 2002).
- the ability to use network relationships to obtain beneficial outcomes (in the sense of Coleman, 1998 and Putnam, 2000) do not need to bring benefit to the whole society or even for the network or might even harm people outside the network (Portes, 1998; Arrow, 1999; Durlauf, 1999; Sobel, 2002).

**Table 1 Overview on selected definitions of social capitals in literature**

<b>Author(s)</b>	<b>Definition 'Social Capital'</b>
Bourdieu (1986) quoted after Sobel (2002)	'Social capital is an attribute of an individual in a social context. One can acquire social capital through purposeful action and can transform social capital into conventional economic gains. The ability to do so, however, depends on the nature of the social obligations, connections, and networks available to you'
Coleman (1988)	'People's ability to work voluntarily together'
Bourdieu and Wacquant (1992:119)	'Social capital is the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition...'
Grootaert (1997: 78)	'In the political science, sociological, and anthropological literature social capital generally refers to the set of norms, networks, and organizations through which people gain access to power and resources, and through which decisionmaking and policy formulation occur.'
Putnam (1997) (cited after Sobel 2002:146)	'features of social life – networks, norms and trust – that facilitate cooperations and coordination for mutual benefit'
OECD (1998: 9) (cited after Schuller, 2001, p. 3)	'the knowledge, skills, competences and other attributes embodied in individuals that are relevant to economic activity.'
Dyllink and Hockerts (2002)	They describe re are two types of social capital: human capital and societal capital.  Societal capital, on the other hand, includes the quality of public services, such as a good educational system, infrastructure or a culture supportive of entrepreneurship
Sobel, 2002 (following Bourdieu, 1986)	Social capital describes circumstances in which individual can use membership in groups and networks to secure benefits
Farley and Costanza (2002: 252f) (referring to World Bank, 1999)	'Social capital refers to the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions. Increasing evidence shows that social cohesion is critical for societies to prosper economically and for development to be sustainable. Social capital is not just the sum of the institutions which underpin a society – it is the glue that holds them together.' <sup>1</sup>
Strange and Bayley (2008) OECD Insights: Sustainable Development p. 106	With this model, a society's total capital base encompasses five individual types: ... social capital in the form of social networks and institutions
Ostrom and Ahn (2009:20)	...Multiple forms of social capital....Three types are particularly important in the study of collective action: (1) trustworthiness, (2) networks and (3) formal and informal rules or institutions. ...We view social capital as an attribute of individuals and of their relationships that enhance their ability to solve collective-action problems. ...
World Bank (2010)	Social capital refers to the norms and networks that enable collective action.

<sup>1</sup> From <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/EXTSOCIALCAPITAL/0,,contentMDK:20185164~menuPK:418217~pagePK:148956~piPK:216618~theSitePK:401015,00.html>

- the network interaction might lead for the group to a bad equilibrium, whereas the individual is better off to join the group in order not to get negatively targeted by the group, but the group asks from all of its members risky or negative behaviour leading to a situation where all the members would be better off without the group (Sobel, 2002)

The problem of the multi-faceted term of social capital has another origin also in the fact that material and immaterial features are mixed up and that its immaterial features are often based on material ones.

Hence, it does not astonish that even in social scientific literature the call gets louder to more clearly distinguish the resource side and the flows there from.

Criticism in this direction has been early raised by Woolcock (2001:70) according to whom definitions of social capital should rather focus on 'sources rather than consequences'. Similar, Prakash and Selle (2004:18) question with regard to the different parts of definitions of social capital 'which is the stock and which is the flow here?'. And in general, Sønderskov (2009) ends her overview on environmental literature related to social capital with criticism on the very different conceptions of social capital and with a call for further research assessing 'whether, why, how and when social capital helps solve environmental problems'.

Social capital should therefore

1. be rather seen as a type of stock/source or sink at a certain time that later in a functional view can be capacitated in two different ways, enabling (such as source of joy) or assimilative (such as a sink of frustration)
2. be quantitatively defined, such as through
  - a. an adequate number of individuals or
  - b. an individual alone.
3. be also defined qualitatively such through
  - a. genetically predetermined measurements, skills and interests and/or
  - b. not genetically predetermined measurements, skills and interests.

With regard to the quantitative element, depending on the task to be executed an individual or a certain number of individuals might or might not be able to succeed, purely to quantitative reasons. Their social capital in numbers is just appropriate or inappropriate. Examples therefore are the construction of huge buildings which would be impossible for states with a small number of populations (except if they had the capacity to attract or force the help from foreigners). Many tasks are also impossible to be achieved by a single person.

With regard to the qualitative element, measures, skills and interests might be genetically predetermined. If not, a person might try as much as possible in a certain discipline but would never succeed. If from two athletes with the same weight one is simply 50 centimetres taller, that one will always be the one better in high jumping. Musical abilities can be trained to a certain extent, but the one with a genetically higher predetermination is automatically better off than the other one training to the same extent. The personal interest for a certain subject (motorcycles, music, nature....) determines also a type of social capital which can be inherited. And as much as one tries out, this person may not develop an interest for another specific issue. Social capital therefore includes also strong elements of personal characteristics such as sex, inherited intelligence, inherited interests, inherited abilities or inherited health.

### 4.1.2 Human capital

The term 'human Capital' is by far less often defined in the literature than social capital. Some definitions are provided in **Table 2** below.

**Table 2** Examples of definitions of human capitals in literature regarding sustainable development

Author(s)	Definition 'Human Capital'
Schulz, 1961 (cited by Ostrom, 2009:20)	Human capital includes many kinds of different forms of knowledge and skills (Schultz, 1961)
Dyllink and Hockerts, 2002	They describe human capital such as following in the sense of one of two types of social capitals (the other one is societal capital): 'Human capital concerns primarily aspects such as skills, motivation and loyalty of employees and business partners.'
Farley and Costanza, 2002, p. 252f (referring to 'Brainmarket, no date')	"practical knowledge, acquired skills, and learned abilities of an individual that make him or her potentially productive and thus equip him or her to earn income in exchange for labour"
Strange and Bayley, 2008. OECD Insights: Sustainable Development p. 106	With this model, a society's total capital base encompasses five individual types: .....human capital in the form of an educated and healthy workforce; ....

From **Table 2** it can be first seen that the definitions refer to similar features but secondly that the definitions are different regarding the manner these features are established. Some do not distinguish at all between inherited and not inherited features while others only include one of them. Most of the definitions contain also an economic focus.

Ostrom (2009:20) describes an a bit broader, not economic oriented picture. She states regarding human capital, that an individual defers current consumption and pleasurable activities to acquire better skills and knowledge that can potentially increase future benefits (young people going to college receiving knowledge; athlete builds human capital by eating healthy food, build up muscular strength and good health, develop endurance; musician spends time and efforts practicing to enhance their skills on an instrument).

But a mentioned in the earlier chapter, the inheritance play also a crucial part in the question if an individual builds up body mass, knowledge, skills and interests.

### 4.1.3 Common aspects

A comparison of **Table 1 and 2** already indicates that many authors do not use definitions of social and human capital together. Those who commonly apply it try to distinguish them rather in a quantitative way (e.g. Farley and Costanza, 2002) or rather tend to use the term human capital as the source and social capital as a sort of 'follow up' (e.g. Strange and Bayley, 2008).

Furthermore, as already shown above the term human capital is partly already integrated in the sustainability related literature into the definition of social capital (see e.g. above Dyllink and Hockerts, 2002). In a similar way, social capital is often distinguished into two features which are more individual and more collective forms of social capital (see e.g. recently Esser (2008) with further literature). This connotation on 'more' indicates that already the distinction is difficult as more than one person clearly constitutes a 'collective'. Furthermore the whole social network worldwide consists of countless sub-networks build up upon, by and on behalf of individuals.

In summary, with regard to social sciences the analysis shows clear and wide overlaps exist between social capital and human capital with regard to their quantitative and qualitative scope (**Table 3**).

**Table 3 Comparison of aspects of social and human capital in social science definitions**

Scope	Social capital	Human capital
Quantitative scope	Mainly addressing more than one individual	Mainly addressing one individual
Qualitative scope	Mainly addressing stocks of and flows between individuals/groups	Mainly addressing stocks of and flows within one individuals

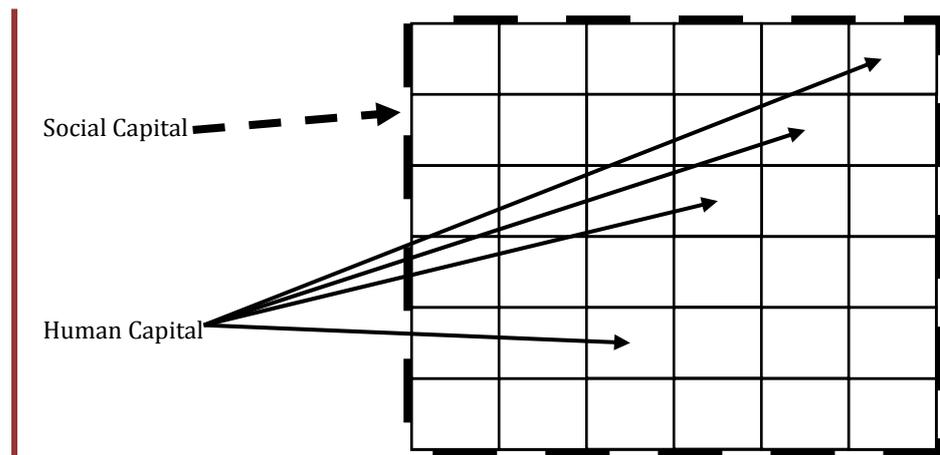
The assessment further indicates that the distinction is - especially with regard to inherited personal characteristics - rather of scientific interest than of practical usefulness in the discussion on degrowth.

#### 4.2 Perspectives of social and human capital with regard to degrowth and sustainability

The analysis till now shows the close relationship and wide overlap between the two terms social capital and human capital.

Thus, in the sense of a more integrated approach (Piazza-Georgi, 2002) human capital should be therefore identified in the Sustainability and degrowth discussion rather as multi-sub-section of social capital (see Fig. 3).

**Fig. 3 Relationship between social capital and human capital**



In the sense of Fig. 3, but due to the higher abstraction level 3-D Sustainability did not distinguish between human capital and social capital (see above fig. 1 and 2 and Mauerhofer, 2008).

Human capital and social capital are terms that were mainly developed with one field of sciences, namely social sciences. Social capital and human capital were terminologically introduced by social scientists, partly even in order to parallel their own field of sciences more with other disciplines such as economics and environment (Coleman, 1988).

As shown above, even within social sciences these two terms are by far not unified defined respectively, but widely applied. Already even within social science severe doubts on the practicability of the current interpretation and application of the term 'social capital' more and more become obvious.

A more focused definition of social capital would enhance the original idea and support in an interdisciplinary research field such as the one on socially sustainable economic degrowth to include also the economic science stronger into the discussion.

The current definition of social capital does therefore not become useless as it should only be partly transferred towards the term 'social capacity' in order to contribute to the definition of that term (see next chapter). But also the term 'social capital' itself has to be redefined due to its premature weakness with regard to the discussion about sustainable development.

Therefore based on the analysis till now, as a final description social capital

- a. can be seen as a type of stock at a certain time and
- b. can be enabling (such as source of joy) or absorptive (such as a sink of frustration) and
- c. has to be quantitatively and qualitatively defined through an adequate number of individuals or an individual alone and genetically predetermined or other measurements, skills and interests.

Thus, in the following only the term social capital will be used which consist of multiple, namely two or more sections also human capitals.

### 4.3 Social capital (including human capital) and social capacity

Social capital has been defined especially in social sciences in a very broad sense and this variety of definitions has also been introduced into the discussions about growth and sustainable development.

Social capital in the sense of measures, skills and interests such as described above might be only expressed in as certain environmental, social and/or economic context, it has to be 'capacitated'. This leads to the term 'social capacity' in the sense of 3-D Sustainability.

For instance, the best poems of a poet will not be distributed without a medium (paper, radio, TV, internet) or an artist receives special support by another person and/or by a grant. Skills and interests of pupils/students might the first time be acknowledged at the school/university by professor and adequately fostered. Specific pupils might individually learn better than in a group/network. Students often are only able to attend a college by means of financial support from outside. In the broadest sense it can be said that the capital's capacity has to be build up.

Social capacity includes the qualitative and/or quantitative development of e.g. population size, lifestyle, health, education, age, tolerance and participation. The close and reflexive relationship between social capacity and social capital can be seen for instance in relation to 'health'. For example, the condition of an embryo or a new born child is in most, if not all, cases influenced by the status of health as a factor within social capacity, which is influenced by the other two capacities (Mauerhofer, 2008). Furthermore social capacity covers features such as the institutional context (political and organisational system, etc.), non-market carrying structures and services, property rights distribution, culture (traditions, ethical values, etc.), technology and know-how (in the sense of Martinez-Alier, 2002: 22; see Mauerhofer, 2008).

In general, the social capacity column in **Fig. 1** and **Fig. 2** above is fed, if needed, by social capital from the base and interrelated with as well as influenced by the other two columns in the sense of 3-D Sustainability (Mauerhofer, 2008). The social capacity column also symbolises the social capacity in terms of the qualitative and/or quantitative developed respective temporary status of the social capital and is reflexively influenced through the triangle by the other two capacities expressed in fig. 1 (see for more detail on that Mauerhofer, 2008).

This capacity building of social capital can happen

- self motivated or motivated from outside
- materially or immaterially motivated

- alone or together (two persons, a group, a network)
- without external resources (e.g. whistling, dancing) or with external resources

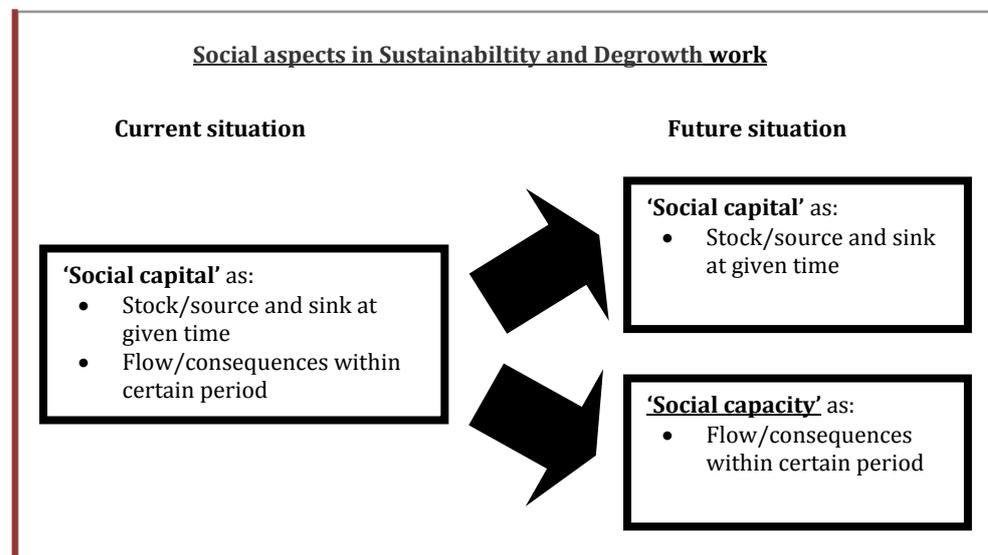
Based on this link to the external resources (environmental sinks and sources) the limits of growth are also expressed through the limits of social capacity, the social carrying capacity, which will be in discussed in the last chapter of the results.

Social capacity is then rather the flow from the social capital (see also e.g. Woolcock, 2001; Robinson et al., 2002). It describes flows/consequences from social capital during a certain period and stays within the social and environmental carrying capacity (Mauerhofer, 2008).

A bit less differentiated, already Portes (1998) defined social capital as the capacity of individuals to command scarce resources by virtue of their membership in networks or broader social structures. Similar, Olate (2003:13) named some of his outcomes of social capital as ‘capacities’ (the capacity to ‘get by’, e.g. meet child care needs and the capacity to ‘get ahead’, e.g. gain opportunities for change).

For the analysis until now, the following result can be visually described (see **Fig. 4**):

**Fig. 4** Current and future situation of Social capital and capacity



**Fig. 4** advocates for the future work on sustainability and degrowth to leave the multifaceted terminological labyrinth of social capital such an applied within social science towards a stronger binominal distinction into social capital and social capacity.

#### 4.4 Social capacity and capability

This chapter deals with the distinction between and overlap of capacity and capability in the social sense. Therefore it starts with an additional and closer look on the term ‘social capacity’.

The word ‘capacity’ is widely applied within the environmental sciences. There it refers especially to the stock/source and the sinks function of nature. In a similar way, social capacity can be divided in social stock/source function and social sink function (which can be assimilative or enabling such as already described above with social capital).

Social capacity can be therefore defined as growth or development of each and all hierarchical levels of human or social integration within a certain spatial range, shaped by unilateral, multilateral and/or interdependent processes within an individual and between individuals or groups of individuals.

Social capacity consists of the sum of human capacity and the additional (positive or negative) aspects solely achieved through cooperation.

While the relationship between the social capital concept and the capability approach (Sen 1987, 1999) was recently closer examined by Comin (2009), the social capacity concept and the capability approach did not seem to have been given the same kind of attention yet.

Sen (1987) introduced with his capabilities approach the idea of development as economic growth and defined human development as the process of enlarging a person's functionings and capabilities to function, the range of things that a person could do and be in her life. Sen (1999) then formulated a framework that puts freedom as the central feature of development. He advocates that by providing freedom poor people are given the means to become agents of change and are granted the autonomy to achieve the life they would like to lead.

The capability theory of Sen (1987, 1999) was extended by Ballet et al. (2003; cited after Lehtonen 2004: 203-204) to cover also societies.

Especially as the term 'capacity' appears to have the wider formulation and includes also expressions of the term 'capability', in the sense of a 'potential', 'ability' and/or 'performance'. This is for example also valid for the expression and use of these terms in the German language.

Comin (2008) assessed the relationship between the capability approach of Sen and the social capital concept whereas – and that was one of his first main conclusions - latter (in the sense of Putnam's concept of social capital) may better refer to 'capability' than to 'capital' (p. 644). Similar, fig. 4 above indicates that social capital partly should be rather seen as social capacity as far as it concerns the flows and consequences.

Comin (2008) furthermore starts to distinguish capabilities into individual capabilities and social capabilities whereas latter 'are those capabilities that can only be achieved socially, and that represent those sets of beings and doings that can only be achieved as a result of social interaction.'(p. 644). Despite this intensified use of the capability approach he echoes in the same paper much criticism about the (too) individualistic direction of the capability approach, suggests the 'de-individualization of the capability perspective' (p.644) and further proposes 'to include value assessments of social structures' (p. 642). In this sense, the second main capability approach, the one of Nussbaum (2000), takes a more ethical direction that has effects to social and environmental limits of degrowth. She strives to express an account of how capabilities, together with the idea of a threshold level of capabilities, can provide a basis for central constitutional principles that citizens have a right to demand from their governments (Olate, 2003).

In summary, the capital and capacity dichotomy applied within 3-D Sustainability (**Fig. 1 and Fig 2**) appears to be quite coherent with the capability approach of Sen and provides by including environmental and social thresholds even an improvement from the viewpoint of degrowth and sustainability. The meaning of 'capacity' and 'capability' in different languages is closely connected and both deal widely with the sustainable development of the source 'social capital'. But the social capacity approach appears to provide the advantage that it is less individualistic and obeys the limits provided by the social carrying capacity.

#### **4.5 Social carrying capacity**

The term 'social carrying capacity' is hardly closer defined and used in science. In general, this term has to be analysed always regarding a certain spatial range. This can be in the one extreme the global range as well as the in the other e.g. a single small spatial unit (such as one human when it comes to the individual's carrying capacity).

Depending on the appropriate spatial range chosen the interdisciplinary research questions with regard to sustainable development can be chosen. The correct identification of this spatial level is a precondition for the identification of the correct measures not exceeding the carrying capacity. This applies as well to the social as well as to the ecological (environmental) carrying capacity. Del Monte-Luna et al. (2004) defined ecological carrying capacity as 'the limit of growth or development of each and all hierarchical levels of biological integration, beginning with the population, and shaped by processes and interdependent relationships between finite resources and the consumers of those resources'. With regard to the spatial range of an individual protected area the concept of carrying capacity is often discussed, either with regard to environmental issues such as effects on species and social issues like tourist satisfaction respectively alone or together (Prato, 2001; Navarrete et al., 2004).

There from differing, other studies on the social carrying capacity of water related issues start again more from a spatial level often defined by human-made borders and defined as a sort of urban or human carrying capacity with regard to certain water related types of human use (Oh et al., 2005; Yue et al., 2008). Apart from this examples related to the social and environmental carrying capacity of water and biodiversity related issues, the social carrying capacity is started to be assessed also with regard to issues such as roads and subway (Oh et al., 2005). Read and LeBlanc (2003:60) use especially regarding humans the term 'carrying-capacity stress', but rather in relation to the environmental resource availability.

Close to the above cited definition of ecological carrying capacity brought forward by Del Monte-Luna et al. (2004) the social carrying capacity can be defined as:

*'the limit of growth or development of each and all hierarchical levels of human or social integration within a certain spatial range, shaped by unilateral, multilateral and/or interdependent processes within an individual and between individuals or groups of individuals'.*

In italics the definition of the social capacity used above is already included.

The relationship between social carrying capacity and the other two forms of carrying capacity has been already discussed by Mauerhofer (2008:499). Additionally, on the example of a protected area it can be shown that the social carrying capacity on the individual or collective level may already be crossed even if the environmental carrying capacity is not reached yet.

**Table 4** summarizes the current and especially future relevance of the term 'social carrying capacity' with regard for example to future limits of population growth and restrictions on technical overload appear to be obvious.

**Table 4** Status quo and perspectives of the term 'social carrying capacity'

Social carrying capacity	
Status quo:	Future potential relevance e.g.:
Hardly defined anywhere	Future limits to population growths
Hardly used in sustainability and degrowth science, except e.g. in:	Trade off's between population growth and per capita consumption
Protected area visitor management (visitors ↔ visitors)	Research in social riots with regard to equality issues (income distribution etc.)
Traffic and water planning with regard to 'urban or human carrying capacity'	Technical overload (and related resource questions)

However, it is quite clear that it is much more difficult to measure and define social carrying capacities than environmental one's as different cultures, opinions and attitudes additionally appear in separate societies of the human species. That makes it harder to specify or even estimate when a certain social limit in the sense of a social carrying capacity will be reached.

## 8 Conclusion

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3-D Sustainability such as introduced by Mauerhofer (2008) appears to be a helpful approach defining the social dimension of the discussion on degrowth and sustainable development. The terms social capital, social capacity and social carrying capacity used in 3-D Sustainability are not new, but already discussed in several fields of science. The paper provides clarifications of the specific meanings of these three terms in connection with socially sustainable degrowth. The results indicate with regard to social capital that human capital is only a multi-subsection of social capital. Furthermore, the paper advocates that the broad application of social capital within the social sciences should be reduced for the more interdisciplinary sustainability and degrowth discussion to its stock/source and sink function of that capital. While the flows and consequences derived from social capital should be covered by the term social capacity. This constitutes – in comparison to the similar capability approach of Sen – also more coherence with the third term, the social carrying capacity. Latter covers the limits of the social system relevant to the degrowth and sustainability discussion. The paper provides for all these three terms definitions, examples as well as perspectives for their further application. Thus, it contributes to a more conceptual sound and coherent theory of socially sustainable economic degrowth in the whole debate about degrowth and sustainability.

## Acknowledgements

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The author is grateful to Klaus Hubacek for his helpful comments on a former version of the paper as well as to participants of the 2nd Degrowth Conference held in Barcelona from 26th to 29th March 2010 for the useful discussion of the paper presented there. Of course, the usual disclaimer applies.

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