Sustainable development
and social robustness[1]

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> So much has been written in recent years on environmental sustainability and sustainable development that one needs a good reason for adding, as I propose to do here, to the already burdensome task imposed on anyone trying to read it all. Perhaps the best reason would be to promise to make the task more manageable by reducing the indigestible meal to a bite-size chunk – a chunk which nevertheless contains all (or nearly all) the ingredients of the meal itself. This has, of course, been attempted before, but typically it has not been attempted in quite the way I propose here.
> (Dobson, 1996, pp. 401-402)

This apt reflection by Andrew Dobson was made in the mid-1990s, when it had become apparent that sustainable development had been adopted as a leading notion in planning and policy-making. Now, one and a half decades later, the meal of sustainable development literature is not only indigestible, but has grown to incomprehensibility in all thinkable ways. At this stage I will not insist that my addition to the growing body of literature in the field is a groundbreaking step forward. This is my own digestion of a giant meal, an attempt to serve to the reader a homemade dish based on key ingredients of that meal.

Apart from the purpose of analysing the concept of sustainable development in general, there is also a specific aim in this thematic paper to discuss how sustainable development can be interpreted in the context of Swedish rental housing areas and participative open space management there. The paper's first section discusses the historical development of the concept. Thereafter, it examines the concept's dual nature and the paradox of combining the contradictive sustainability and development paradigms. The following sections deal with the two perspectives of needs and robustness. Eventually, it concentrates on the social aspects, which are most relevant in the chosen context.

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The evolution of a concept, a discourse and a new political vision of a better world

According to Stephen Wheeler (2004, p. 19), the phrase 'sustainable development' was used in its modern meaning for the first time in the books *A Blueprint for Survival* (Goldsmith) and *The Limits to Growth* (Meadows et al.), both published 1972, which was also the year of the first major UN conference on environment and development issues, held in Stockholm. However, the general breakthrough of the concept of sustainable development had to wait another fifteen years, until the so-called Brundtland Report, *Our Common Future*, was published. The report was compiled by the World Commission for Environment and Development (WCED), led by Norwegian Prime Minister Gro Harlem Brundtland for the UN General Assembly. Looking back, it can now be established that the work of the WCED in the mid-1980s came to form the skeleton of the discourse that was moulded during the 1990s in connection with the UN Conference on Environment and Development (UNCED) in Rio de Janeiro 1992 and the many international, national and local processes it led to. Not least, it is obvious that one of the formulations used to define the concept of sustainable development in *Our Common Future* has become one of the most frequent phrases quoted in academic and policy literature. There is no doubt that it is the standard definition of sustainable development, used widely enough to count as general knowledge.

> Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
> (WCED, 1987, p. 43)

A brave step towards a new paradigm or a weak concession to economic interests

Richard J. Estes (1993, pp. 5-6) asserts that there were at least nine different ideological movements converging before the UNCED conference, together establishing the philosophical foundation of the sustainable development concept: the early US environmental movement, the anti-war/anti-nuclear movement, the world order movement, the world dynamics modelling movement, the European green movement, the alternative economics movement, the women's movement, the indigenous peoples movement, and the human rights movement. In this process, traditional movements were broadening their scopes and adopting new perspectives. Looking into the mainstream environmental movement, Timothy O'Riordan points at a typical shift in the revision of the *World Conservation Strategy*, published by the International Union for the Conservation of Nature and Natural Resources (see IUCN, 1980; 1989). From the 1980 edition's "more formal airing" of sustainable utilisation of natural resources, the 1989 revised edition "lay much greater emphasis on the protection of cultures, and indigenous ways of managing resources, than on the resources themselves" (O'Riordan, 1993, p. 49). Another example of development of more integrated approaches is the ecofeminism movement, launched among European feminists by Françoise d'Eaubonne in the 1970s and spread in low-income countries through the writings of Vandana Shiva in

the 1990s, in which human exploitation of nature is linked to patriarchal suppression of women (see, e.g., Mies & Shiva, 1993).

Although different agendas and ideologies could largely be merged in the formation of a broad sustainable development discourse, it has also been a matter of compromising and adapting to a more pragmatic and less utopian development approach. Typically, many critics accuse *Our Common Future* and the outcomes of the conferences that followed for glossing over the underlying disparities between environmental movements and liberal economic politics, resulting in necessary fundamental reformation of society being withheld as a concession to pragmatic but short-term economic interests (see, e.g., Adams, 2001). This conflict diffusion is apparent in the way *Our Common Future* is formulated. Directly after the famous definition of sustainable development cited above is a clarification (WCED, 1987, p. 43):

> It contains within it two key concepts: the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs.

First, this statement allows diverging interpretations of what "essential needs of the world's poor" encompass (a question addressed in next section). Second, the quotation reveals the viewpoint that we should not think of any absolute limitations to growth and exploitation of natural resources. As noted by William M. Adams (2001) and others, this opens for an optimistic (many environmentalists would say naïve) trust in technological innovations and institutional potentiation to solve the problems that are apparent today. As it does not explicitly oppose the capitalistic system or any of the basic institutions of modern society, the Brundtland definition of sustainable development may be used in a variety of contexts and by actors with different interests. "The staying power of the concept is understandable, if not forgivable", as sarcastically expressed by O'Riordan (1993, p. 37). Or, as maintained by my colleague Jaan-Henrik Kain (2003, p. 23):

> ...mainstream sustainable development emphasises economic growth as a means to eradicate poverty as well as to ensure proper environmental management. However, continuous economic growth is evidently incompatible with the notion of limits to growth – i.e. the belief that global ecosystems have a finite capacity to support growth in resource consumption. The magic formula introduced by mainstream sustainable development – and possibly one of the reasons for its success – is to resolve this contradiction by arguing that these limits are not all absolute, but are instead imposed on us by the state of our technology and social organisation – i.e. by the quality of growth rather than by growth itself.

In many ways, it must be recognised as an extraordinary effort by policymakers around the world to unite around sustainable development as an overarching vision, or at least a leading notion, for any discussion on development. It must also be recognised, however, that reaching consensus on the notion is not free from conflict.

Sustainable development – a paradox?

The formation of the mainstream sustainable development discourse can be related to the ancient dichotomy between nature and society, often formulated as the dilemma of combining societal development with environmental conservation, which has been an underlying theme in the sustainable development debate ever since the Stockholm conference. Michael Risk once sarcastically stated that "no scientist could ever have coined a phrase so internally self-contradictory" as sustainable development (Risk, 2006). The self-contradiction can be seen already in the combination of the two words. The term 'sustainable' relates to notions of stability, balance and conservation while 'development', quite the opposite, relates to things like growth, change and progress. It would be possible to connect these terms to two totally distinct ideological paradigms, as illustrated in Figure 1. In a way, this is exactly what many critical analysts have done, albeit not explicitly.

In the context of sustainable development, the term *sustainability* originates first and foremost from the environmentalists' concern about threats to our eco-systems. Through studies of population dynamics, the science of ecology has developed models of 'carrying capacity', which is the theoretical limit defining the size of the population a certain place and situation can sustain (see, e.g., Sayre, 2008). The carrying capacity is of course not an absolute limit; it depends heavily on the dynamic relations within the eco-system and will be affected by changes outside it. Eco-system dynamics are commonly understood as changes in the proportional relations between different populations, and between the in- and output of matters and energies – changes that respond to each other in a way that the system oscillates around a condition of harmonious balance. In its simple way, *sustainability* can be defined as not escalating the carrying capacity, or as maintaining a harmonious balance within the eco-system, which is also the main message in classical sustainable development publications such as *The Limits to Growth* (Meadows et al., 1972), *Blueprint for Survival* (Goldsmith, 1972) and *World Conservation Strategy* (IUCN, 1980). Thus, it is as much about downholding as upholding. Sustainability is derived from a paradigm of ecological thinking.

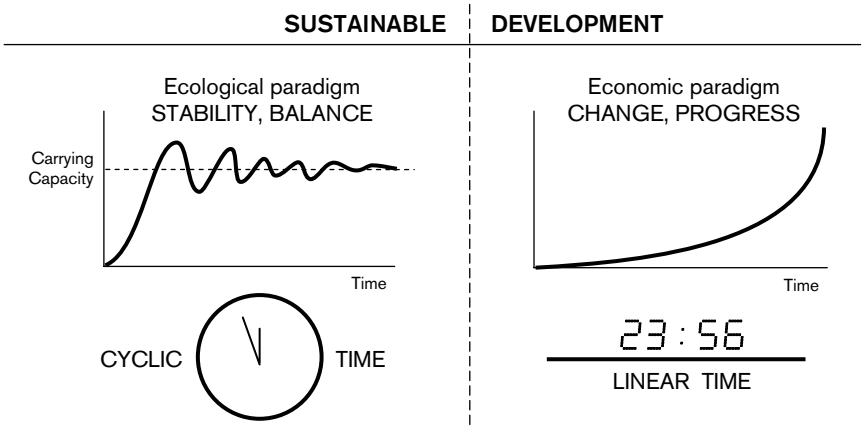

Figure 1. Illustration of some of the features of sustainability and development paradigms according to the discussion above.

The term *development*, on the other hand, is related to words like growth, evolution, progress and advancement, i.e. quite opposite to stability and balance, which characterise sustainability. Since the early 1970s, development and environment were the two main notions when the debate started to take form within the UN. Then as now, a major concern, especially from post colonies, was to increase social opportunities and welfare in poorer countries – an urge to social, institutional and economic development. Growth in natural science is never eternal; it is always only a part of a process that will sooner or later reach its limit and fade out, often in repeating cycles. Even the overwhelming cosmic evolution is described by scientists as a cyclic process. In the liberal economic discourse, however, there is no consideration of such limits to growth. The economist's time perspective is evolutionary and linear in comparison with the ecologist's.

Swedish human ecologist Alf Hornborg describes the two paradigms in terms of two different understandings of development. According to him, many see development as a cornucopia, i.e. a never-drying spring of affluence. Hornborg himself argues that it is instead a zero-sum game, i.e. what looks like growth is merely transfers of resources through time and space. One of his examples is the railway, which actually needed enormous investments in terms of labour and material when it was constructed, so that the apparently higher efficiency it created would disappear if the initial investments were counted off.

> A fundamental techno-philosophical question we should raise is if the nature of the machine primarily is not a means to save, but to displace the withdrawal of time and space resources to weaker groups in the society?
> (Hornborg, 2002, p. 29)

Although Hornborg raises a very valid point in his development criticism, it would be hard to argue that all technical innovations, institutional capacity building, etc., can be reduced to merely an issue of time-spatial resource redistribution. For example, historian Janken Myrdal has convincingly shown how the development of new technological systems for agriculture has been a necessary condition for overcoming crises and increasing the population (Myrdal, 1997). Regarding organisation and institutional systems, the added value of cooperation, for example to solve social dilemmas[3], can also be seen as an example of the opportunities creating added value through societal progress. However (and here Hornborg definitely has a good point), the way we usually conceive development, measured largely by calculating economic growth, does not say much about the 'genuine progress' of society, which should also incorporate well-being, environmental degradation, social conflicts, etc. (see, e.g., Pintér, Hardi & Bartelmus, 2005; Talberth, Cobb & Slattery, 2007).

In my interpretation, there is a paradox inherent in the mainstream sustainable development discourse, as it indeed tries to combine an 'eternal growth' development paradigm with an awareness of the Earth's limits. However, the development paradigm is under transition, and the doubts about what Francis Fukuyama (1989) calls "the end of history", i.e. the final victory of liberal capitalism as the ruling system, have been fuelled by the recent financial cri-

[3] The concept of social dilemmas is discussed in the thematic paper on participation, published in the same dissertation.

ses. There is reason to take a deeper look into the essential meanings of sustainable development, whose conflicting core is normally hidden behind the façade of harmoniously interlacing circles.

Sustainable development as goal and proviso

Referring to Malnes (1990), Langhelle (1999) concludes that the concept of sustainable development consists of an overarching goal, which is development, and a condition (proviso), which is that it must be sustainable (p. 133). The discourse Langhelle describes on the basis of *Our Common Future* is an anthropocentric discourse, whereby natural conservation is only relevant if it benefits people, so that "the goal of development comes logically prior to the proviso of sustainability" (p. 134). On the other hand, *Our Common Future* actually points at a double-directed interdependency between needs satisfaction (development) and environmental integrity (sustainability), which can be seen in the first paragraph in the section defining sustainable development (WCED, 1987):

> The satisfaction of human needs and aspirations is the major objective of development. The essential needs of vast numbers of people in developing countries – for food, clothing, shelter, jobs – are not being met, and beyond their basic needs these people have legitimate aspirations for an improved quality of life. A world in which poverty and inequity are endemic will always be prone to ecological and other crises. Sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life.

As the argumentation goes, meeting human needs is the point of departure. But the elimination of poverty and inequity is also a necessity to avoid ecologic collapse. Avoiding environmental degradation, in turn, is a necessity to secure resources for future generations. The conclusion is that independent of perspective – anthropocentric or ecocentric – *both* meeting human needs and environmental conservation should be key concerns. Development[4] and sustainability are thus reciprocally tied to each other, despite the contradictions highlighted above. Non-development would not be sustainable. Unsustainable development would not be development in the meaning that its major objective is to meet basic needs for all (as the equity principle logically includes not only the current generation but also future generations, and as well-functioning eco-systems arguably are a necessity for meeting human needs). Still, it makes sense to distinguish the two components – development and sustainability – from each other in a theoretical analysis of the concept and its implications. This is the aim of the two following sections.

[4] The notion of 'development', here as in the dominating sustainable development discourse, refers to development that is 'just', i.e. aiming at needs satisfaction for all, and (more) equal distribution of resources among people and nations. There may of course be other ways of looking at the notion of development, which do not include aspects of needs satisfaction and equity.

The development goal – meeting human needs

As shown above, the development component of the sustainable development discourse has often been formulated as the goal of satisfying human needs. In *Our Common Future*, for example, meeting these needs is the whole idea of sustainable development, not only constituting the goal but also laying the basis for the need of sustainability. The sustainability proviso is a logical extension of the needs-meeting goal, as the goal also encompasses future generations. A question remains, however, namely how 'needs' should be understood. The concept is seldom thoroughly explained or analysed in the sustainable development discourse, which is perhaps one reason sustainable development has been such widely accepted as a leading notion. *Our Common Future* emphasises that it is "the essential needs of the world's poor" that should be the first priority (WCED, 1987, e.g. on page 43). This statement draws attention to the claims of a more equal resource distribution between different countries and between different groups of people. However, there are no clear requests in the report for mechanisms to redistribute the resources. The main strategy for poverty eradication are instead to enhance economic growth in poor countries to create more job opportunities and to keep population growth down. In other words, *Our Common Future* does not give any clear directions regarding the redistribution of resources *from rich to poor*.

Let us reflect on the difference between the following two ethical principles:

1. All human beings should have the opportunity to satisfy their essential needs.
2. The available resources on earth (i.e., what can be harvested without depleting the stock of natural capital) should be equally distributed between humans.

The first proposition equals what *Our Common Future* and the mainstream discourse tell. The second is a much more radical ethical principle, represented by, e.g., the idea of 'environmental space' as promoted by the organisation Friends of the Earth (see, e.g., McLaren, 2003). If the equal environmental space principle were adapted, a discussion on human needs would be superfluous. The point of departure would be that resources should be redistributed equally, which would automatically give everyone the opportunity to satisfy their essential needs. However, this kind of principle remains a utopian vision in the margins of academic debates, far from current political agendas, and hence it is necessary to return to the question of what human essential needs are.

A well-known and widely used theory of needs is psychologist Abraham Maslow's (1943) 'hierarchy of needs'. There are five categories of needs in the hierarchy, often reproduced graphically as a pyramid: (1) physiological, (2) safety, (3) love, (4) esteem, and (5) self-actualisation. Maslow's theory is based on the conclusion that some needs are more basic than others – that "the appearance of one need usually rests on the prior satisfaction of another, more pre-potent need" (Maslow, 1943, p. 370). As he argues, "[a] person who is lacking food, safety, love, and esteem would most probably hunger for food more strongly than for anything else" (p. 373). However, Maslow's own em-

pirical data showed that the proposed hierarchy is not a clear and universal structure. For example, many seemed to value esteem higher than love, which Maslow interpreted as a kind of misunderstanding – that they sought high self-esteem indeed as a means to get love (p. 386). Maslow admitted that the strong hierarchy model may be misleading, as 'higher' needs may well emerge even though all more basic needs are not fully satisfied. "[I]f I may assign arbitrary figures for the sake of illustration, it is as if the average citizen is satisfied perhaps 85 per cent in his physiological needs, 70 per cent in his safety needs, 50 per cent in his love needs, 40 per cent in his self-esteem needs, and 10 per cent in his self-actualization needs" (pp. 388-389).

The emphasis on the hierarchical relationship between needs has been criticised. One of the most influential debaters in this field is Chilean economist Manfred Max-Neef, recipient of the 1983 Right Livelihood Award and founder of the Centre for Development Alternatives. He argues that "fundamental human needs must be understood as a system, the dynamics of which do not obey hierarchical linearities. This means that, on the one hand, no need is *per se* more important than any other; and, on the other hand, that there is no fixed order of precedence in the actualisation of needs" (Max-Neef, 1992, p. 211). Max-Neef has criticised mainstream development practices for being sectoral and short-term. In the early 1980s, he and his colleagues at the Centre for Development Alternatives proposed a new approach called Human Scale Development, based on three pillars (Max-Neef, 1992):

- the satisfaction of fundamental human needs
- the generation of growing levels of self-reliance
- the construction of 'organic articulations' (which can also be expressed as relations of balanced interdependence) between different pairs of elements, such as global and local, people and nature, people and technology, personal and social, planning and autonomy, civil society and state

Max-Neef has recognised nine 'axiological' categories of fundamental human needs, which are postulated to be spatially and temporally consistent among individuals from different cultures. By placing four 'existential' needs categories along a second axis, a matrix is formed which gives an overview of Max-Neef's needs categories (see Table 1).

Besides the proposition that needs are non-hierarchal, Max-Neef elaborates on the universality of needs. His conclusion is that needs have been relatively (but not totally) consistent throughout time and culture. On the other hand, he also argues that the composition of fundamental needs has been changing throughout history in an evolutionary manner. While needs for subsistence, protection, affection, understanding, participation, creation and leisure have reasonably existed since the birth of the human species, Max-Neef assumes that the need for identity is of a later date and that the need for freedom is a relatively new phenomenon. Furthermore, he predicts that yet another aspiration will likely emerge as a tenth universal and fundamental need as society continues to evolve, namely the need for transcendence. This argumentation indicates that the border between fundamental needs and aspiration is sometimes diffuse and subjective.

Table 1. A matrix of satisfiers within Max-Neef's typology of human needs (source: Table 7.1 in Max-Neef 1992, p.206-207; also published in Cruz, Stahel & Max-Neef, 2009)

Need according to axiological categories	**Needs according to existential categories**			
	Being (personal or collective attributes)	*Having (institutions, norms, tools)*	*Doing (personal or collective actions)*	*Interacting (spaces and atmospheres)*
Subsistence	physical health, mental health, equilibrium, sense of humour, adaptability	food, shelter, work	eat, procreate, rest, work	living environment, social setting
Protection	care, adaptability, autonomy, equilibrium, solidarity	insurance systems, savings, social security, health systems, rights, family, work	co-operate, prevent, plan, take care of, cure, help	living space, social environment, dwelling
Affection	self-esteem, solidarity, respect, tolerance, generosity, receptiveness, passion, etc.	friendships, family, partnerships, relationships with nature	make love, caress, express emotions, share, take care of, cultivate, appreciate	privacy, intimacy, home, spaces of togetherness
Understanding	critical conscience, receptiveness, curiosity, astonishment, discipline, intuition, rationality	literature, teachers, method, educational policies, communication policies	investigate, study, experiment, educate, analyse, meditate	settings of formative interaction: schools, academies, communities, families, etc.
Participation	adaptability, receptiveness, solidarity, willingness, determination, respect, etc.	rights, responsibilities, duties, privileges, work	become affiliated, co-operate, propose, share, dissent, obey, agree on, express opinion, etc.	settings of participative interaction: parties, associations, churches, neighbourhoods, etc.
Leisure	curiosity, receptiveness, imagination, recklessness, sense of humour, etc.	games, spectacles, clubs, parties, peace of mind	day-dream, brood, remember, relax, have fun, play, etc.	privacy, intimacy, spaces of closeness, free time, surroundings, landscapes
Creation	passion, determination, intuition, imagination, autonomy, curiosity, etc.	abilities, skills, method, work	work, invent, build, design, compose, interpret	productive and feedback settings, workshops, cultural groups, etc.
Identity	sense of belonging, consistency, differentiation, self-esteem, assertiveness	symbols, language, religions, habits, customs, reference groups, etc.	commit oneself, integrate oneself, confront, decide on, get to know oneself, etc.	social rhythms, everyday settings, settings one belongs to, maturation stages
Freedom	autonomy, self-esteem, determination, passion, assertiveness, open-mindedness, etc.	equal rights	dissent, choose, be different from, run risks, develop awareness, commit oneself, disobey	temporal/spatial plasticity

More central in Max-Neef's theory than the needs *per se* is the question of which means we use to satisfy the needs, which he refers to as needs 'satisfiers'. "Each economic, social and political system adopts different methods for the satisfaction of the same fundamental human needs" (Max-Neef, 1992, p. 200). Table 1 presents examples of satisfiers in relation to the different needs categories. Each satisfier is typically part of a complex web of interrelating factors contributing to several needs in different ways. For example, with employment follows a wide range of opportunities of diverse needs satisfaction through the economic income, and it may also contribute to identity building, self-esteem and social networks. Nevertheless, employment is not an absolute prerequisite for satisfaction of any of the needs.

What is perhaps most interesting in Max-Neef's theory is the problematisation of ostensible satisfiers in connection with development policy in terms of violators, destructors, pseudo-satisfiers, inhibiting satisfiers, singular satisfiers and synergic satisfiers (see Table 2). Obviously, we sometimes search for needs satisfaction by taking measures which in the long run are counterproductive. For example, we may invest in armoury for the sake of protection, which may eventually contribute to an arms race that undermines stability and security.

Table 2. Overview of Max-Neef's argumentation of different types of satisfiers or non-satisfiers (drawn from Tables 7.2-7.6 in Max-Neef, 1992, pp. 208-210).

Types	**Description**	**Examples**
Violators and destructors	Measures that are supposed to satisfy certain needs but paradoxically impair the satisfaction of the targeted need as well as other needs	Arms race, censorship, bureaucracy
Pseudo-satisfiers	Stimulate a false sensation of satisfying a given need, however in the long run will not lead to its satisfaction but rather the opposite	Over-exploitation of resources, prostitution, charity
Inhibiting satisfiers	While satisfying a given need, will impair the possibility to satisfy other needs	Over-protective family, obsessive economic competitiveness, commercial television
Singular satisfiers	Aimed at satisfying a single need, without effecting other needs	Food provision programmes, curative medicine, insurance spectacles
Synergic satisfiers	Satisfy a given need, but simultaneously also stimulate and contribute to satisfaction of other needs	Breast-feeding, popular education, direct democracy

Overall, Max-Neef favours a bottom-up approach to development policy. He maintains that the most important question in analysing a society's potential needs satisfaction is how far people are able to influence the structures that

affect their life opportunities (Max-Neef, 1992, p. 201). This is an important comment, as a specific focus in this paper is to interpret sustainable development in relation to participative open space management in Swedish rental housing areas. Strengthening residents' means of influencing their living conditions is also largely about opportunities for needs satisfaction, referring to debates about 'users' influence', 'self-management' and 'local democracy' (e.g. Swedish Government, 1991; 1997; Montin, 1998; Swedish Government, 2000; Wide & Gustafsson, 2001). Thereby, tenant involvement in open space management in general can be viewed as one possible strategy for enhancing needs satisfaction. Naturally, needs satisfaction and life opportunities cover issues that are broader than what can be connected to the management of residential yards. However, previous studies show an impressive breadth of issues connected to participative open space management (see, e.g., Castell, 2009).

The sustainability proviso – robustness in a risk society

Referring back to the sustainable development model as conceptualised by Langhelle (1999), the goal of development is conditioned by a proviso of sustainability. The original and most typical way of explaining the concept of sustainability uses examples of environmental degradation; basically, if we consume or destroy more environmental resources than are being recreated, we will deplete the resource pool. However, there are many other dimensions to the notion of sustainability. Sharachchandra M. Lélé (1991) states that "[a]ny discussion of sustainability must first answer the questions 'What is to be sustained? For whom? How long?'" Lélé argues that distinguishing ecological from social sustainability is an important first step for a more clarified discussion. While ecological sustainability is a frequently used and relatively clearly conceived notion, social sustainability is a highly confused and ambiguous concept (which will be analysed further below). First, however, the concept of sustainability *per se* will be scrutinised.

Sustainability and robustness

It was concluded above that 'sustainable development' is a somewhat contradictive notion. Applying an even more rigid view on the terminology, already the usage of the term sustainability bears a paradox. It is perhaps a philosophical question too complex to give sufficient attention to here, but it could be argued that, actually, nothing can be sustained forever. When even the universe itself is involved in a cycle of birth and destruction, what could possibly be the accurate meaning of a concept like sustainability? A scientifically informed ontology would suggest that everything is always in a state of transition. For physical entities, the laws of thermodynamics explain the ever-increasing entropy, over time releasing exergy through a transition from order to disorder. For non-physical entities, critical realist or relativist theories explain all social constructs as relative and time-spatially bound, i.e. continuously reproduced and reinterpreted. Considering this feature of the world –

that everything will inherently always be in transition – makes sustainability a disturbing notion: ultimately, nothing can ever be sustained.

Perhaps even more disturbing than this generally ignored paradox of the ontological impossibility of sustainability is the term's ostensible objectivity. Theoretically, some situations or developments can be proved unsustainable, e.g. if they lead to the depletion of an essential resource. The concept of carrying capacity within ecology was developed precisely to define such 'sustainability limits'. However, defining carrying capacity involves playing with estimative models, and in connection with policy-making it is also a matter of negotiation between different political interests[5]. In other words, sustainability, even if we ignore its inherent contradictiveness, is impaired by being more of a politically negotiated prospect than an objectively definable state.

Yet another problem with the notion of sustainability is that it is conceived as something that is universally good. As Dale Jamieson (1998, p. 184) points out "there are few who would defend unsustainability". Diverging ideologies therefore make different interpretations of what sustainability is about, adapting it to their own political agendas. As there is no clear antithesis of sustainability, discussing its content may be confusing and sometimes aimless.

To avoid these problems afflicting the term sustainability, I will rather use the term *robustness*, in the meaning of the capability of "performing without failure under a wide range of conditions" (Merriam-Webster, 2009). I argue that robustness more appropriately describes the essence of what sustainability generally aims to conceptualise; first, because it functions well in a reality of constant change (not claiming to be a steady state); second, because it is more explicitly a word which needs negotiation to function (it does not allude to the possibility of precise rules or limits); and, third, because it is not a one-and-only alternative but rather a contestable approach. Clearly, there is no general rule for robustness, such as e.g. the Natural Step's system requirements for sustainability (see, e.g., Holmberg et al., 1999). Robustness must be explained in terms of a specific agenda in a specific context: Which resources are to be protected? For which purposes? Against which type of threats? These questions can be compared to Lélé's questions of what is to be sustained, for whom and how long.

It seems to me that the words sustainability and robustness differ in a linguistic sense. Sustainability is more of a definite state, while there are more clearly degrees of robustness. Just as it is easier to discuss, e.g., degrees of lightness than of whiteness, or degrees of illness than of death, it is also easier to treat robustness rather than sustainability as a relative term. Things are either sustainable or not, but they are always more or less robust. Robustness does not allude to a definite state, as sustainability may do.

Robustness may also be perceived as a controversial notion, typically projecting an image of something stout and sturdy, stably standing strong in turbulent weather. Many perhaps conceive it as conservatively anchored in the past rather than flexibly reshaping things to meet the future. A related term is resilience, borrowed by the sustainable development debate from system

[5] One illustrative example is the efforts by the IPCC (Intergovernmental Panel on Climate Change) to reach a consensus on what levels of carbon dioxide the Earth can hold in the atmosphere, not to mention the debates among policy-makers on how to interpret the IPCC reports and what measures are needed to ameliorate global warming.

ecology (Holling, 1973). Ecological resilience is based on the recognition of 'eco-system equilibriums', i.e. certain states around which the population dynamics will oscillate. Resilience is a measure of the time it takes for the system to return to its equilibrium after a perturbation, or the amount of disturbance needed to move the system to a new equilibrium (Gunderson, 2000). The concept of resilience is also used in development psychology, where it describes a child's capacity for positive behavioural adaptation in spite of trauma or very stressful conditions (Luthar, Cicchetti & Becker, 2000). In contrary to a conservative interpretation of robustness, resilience emphasises the dynamic, polymorphous and adaptive rather than the lasting and persistent. On the other hand, robustness can also be interpreted in a more progressive and future-oriented way, defined as *the capability to withhold certain central values while adapting to stressful conditions and coping with emerging challenges.*

Robustness has been used as a scientific notion in many different disciplines, and lacks a single and coherent definition. In statistics, the notion has been used in data analysis methods which reduce the risk for statistical distortions due to few or minor faults in data series or estimation models (see, e.g., Huber & Ronchetti, 2009). As adapted in a broader epistemological sense, Michael Gibbons (1999) pleads for a new contract between science and society producing 'socially robust knowledge'. In this case, social robustness is based on anchoring in real-world contexts and participation by 'laymen' in knowledge production, which makes it more useful than the classical science based on abstract theoretical models of reliability. Computer scientists commonly talk about robustness as the capability of programs to handle unexpected input without hanging or crashing. Similarly, the notion is used in the automation of systems with different functions, backing up for failures (e.g. Brooks, 1986). Robustness is also a frequent notion in different kinds of network theories, when analysing complex systems' vulnerabilities to sudden pressures. Réka Albert at al. (2000) claim that the Internet, just like social networks and organism cells, is robust against errors due to its 'scale-free' network structure, whereby some nodes develop into multi-connection hubs, relatively independent of geographical distances[6].

Hiroaki Kitano (2002) establishes that robustness in engineering as well as in biological systems is based on four principles: (1) a control system to detect emerging problems; (2) a backup system with multiple components which may substitute for each other in case of failure; (3) intrinsic structural mechanisms to promote structural stability; and (4) a structure with modular physically or functionally isolated subsystems to prevent failure to spread from one module to others. This defines robustness as a much broader concept than do several of the traditions mentioned above. In the following subsection, the concept of robustness is analysed and defined in relation to the discussion on sustainable development, and a number of dimensions are identified.

[6] The concept of scale-free networks refers to networks more or less free from the spatial limitations of, e.g., a road network. In the scale-free network, a stronger hierarchy of connectedness develops, with some highly connected hubs and a relatively large number of nodes with only a few connections. Due to the highly connected hubs, the 'diameter' of the network (i.e., the minimum number of nodes to pass when moving from one side of the network to the other) is relatively small. Actually, this theory can be compared to the theory of axial integration in urban morphology, in which a scale-free network corresponds to a spatially well-integrated street pattern (see, e.g., Hillier, 1996).

Dimensions of robustness

Above, uses of the notion of robustness in different scientific fields are briefly addressed. In the fields of planning research and sustainable development theory, robustness is not a widely employed notion. It was used as the key concept in a Swedish project called the Unbeatable City, where it was defined as "less vulnerable and more sustainable against external stress and threats" (Berglund & Larsson, 1998, p. 8). The model used in the project identifies three dimensions: (1) ecological robustness, based on the careful use of natural resources and protection of ecological systems; (2) social robustness, requiring the democratic participation of citizens in a society where formal and informal rule systems and networks contribute to a well-functioning service delivery; and (3) technical robustness, referring to technical infrastructure technology which will support a sustainable development. The stress and threats outlined in the series of reports published by the project range from terror attacks, disastrous accidents and pandemic infections to communication breakdowns and organisational failures. However, less sudden pressures such as segregation, unemployment, mistrust, global warming, etc., are not studied. Table 3 outlines a tentative extension of the ecological/social/technical robustness model, in which the social dimension is divided into four dimensions (besides a more narrow social dimension, also an organisational, a political and an economic dimension).

Table 3. A tentative list of robustness dimensions relevant for planning theory.

Robustness dimension	**Key explanations**
Ecological	Avoiding depletion of eco-systems
Technical	Ensuring secure services delivery through reliable technical infrastructure
Organisational	Ensuring secure services delivery through reliable institutions
Political	Avoiding armed conflict
Economic	Ensuring secure financial systems
Social	Ensuring social norms of reciprocity and cooperation

Ecological robustness is the central aspect of ecological sustainability as it has been presented in previous sections, i.e. how an eco-system can maintain its functions in the face of emerging pressures. From a planning perspective, this implies the preservation and restoration of robust eco-systems as well as reduction of eco-system threats. The IUCN (1980) and the Natural Step (e.g. Holmberg et al., 1999) provide frameworks for ecological robustness principles. *Technical robustness* is focused on in the reports from the Unbeatable City project (Berglund, 1997a; b; Berglund & Larsson, 1998; Berglund, Flodin & Larsson, 2000). In brief, the approach is based on identifying vulnerabilities in technical infrastructures – telecommunications, power nets, transportation systems, etc. – and uses methods similar to the principles of Kitano (2002) to prevent, monitor, back up and be prepared to solve problems. In these solu-

tions, *organisational robustness* is of utmost importance, i.e. that there is a comprehensive, unambiguous and efficient distribution of responsibilities among institutions in society, capable of trustful cooperation with each other and with civil society. Democratic participation is often cited as a requirement for efficient and reliable institutional capacity (e.g. UNCED, 1992). *Political robustness* also concerns institutional relations, but is more concerned with handling conflicting interests between groups or nations. The worst scenario is armed conflict, which involves a long-term destruction of resources (Collier et al., 2003). Barbara F. Walter (2004) concludes that the two main factors for preventing the reoccurrence of civil war are to (1) improve the quality of life for the poor and (2) give them the ability to influence decision-making through non-violent participation. Therefore, political robustness is highly dependent on institutional performance and vice versa. *Economic robustness* is an issue that is highly actualised through the global financial crisis emerging in the aftermath of the sub-prime mortgage industry collapse in the US during 2008. It can be applied to particular projects and organisations as well as to society as a whole. *Social robustness* deals with norm systems developed through social relations, and connects primarily to debates around social ecology and social capital. Key questions concern the extent to which norms of reciprocity and cooperation are needed in modern society and how they can be maintained.

Of these robustness dimensions, the social dimension is the one which is most directly applicable concerning the context of participative open space management in Swedish housing areas. Other robustness dimensions may be central in other contexts, but in the institutionally relatively well-functioning Swedish society, on the specific scale of housing areas, and particularly in regard to tenant involvement processes, social issues of community-building, norms and local networks have a unique position. It could even be suggested that other robustness dimensions are addressed through these social issues, e.g. in the way environmental-friendly lifestyles can be promoted through local social community mobilisation, or institutional performance and stability can be enhanced through the development of trust within local communities.

Social aspects of sustainable development and social robustness

In discourses on sustainable development, the most widely used model by far is based on the 'triple bottom line' of ecological/environmental, social and economic dimensions (see, e.g., Munasinghe, 1993; Serageldin, 1994). Models based on a dichotomy normally juxtapose nature with human society in one way or another. However, two-dimensional models of sustainable development are rare, despite the typical dualistic approach in many of the theoretical debates (see, e.g., the section on the paradox of sustainable development above). Some influential models, for example as used by the UN Division for Sustainable Development, add the *institutional* dimension to the three mentioned ones (see, e.g., UNDSD, 2001; Spangenberg, 2002). Other models illustrate the complex issue of sustainable development with five or more components, including dimensions such as cultural, political or spiritual. Figure 2-9 show examples of graphic models of sustainable development.

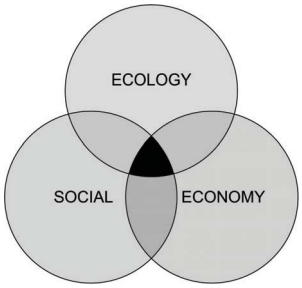

Figure 2. A standard example of the so-called 'triple bottom line', illustrated as three harmoniously interlacing circles and emphasising that the right path is found in the middle, i.e. where all dimensions are considered.

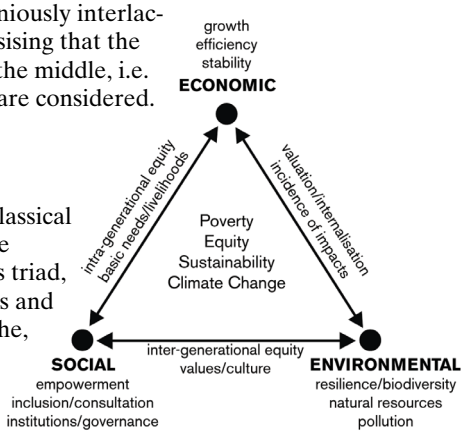

Figure 3. One of the classical prototypes of the same model – Munasinghe's triad, emphasising key issues and principles. (Munasinghe, 1993; 2001)

Figure 4. Another version of the standard triad, showing the paradoxical interconnectedness of the dimensions.

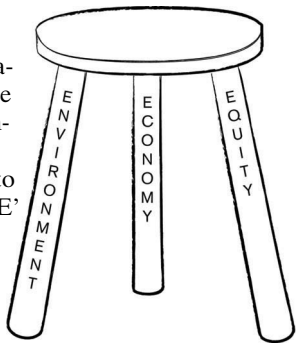

Figure 5. Another common representation of the standard triad illustrates the three dimensions as legs of a stool, emphasising that all are needed for it to stand. In this case, 'society' is altered to 'equity', which gives a delicate 'three-E' taxonomy, popular in US literature.

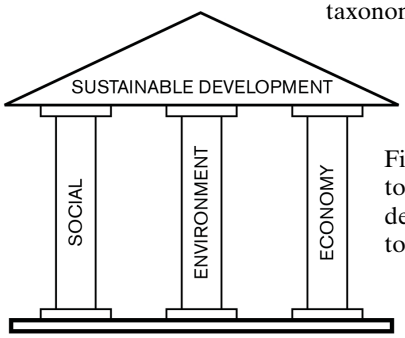

Figure 6. A similar conceptualisation alludes to the art of building, whereby sustainable development dimensions function as pillars together supporting the roof.

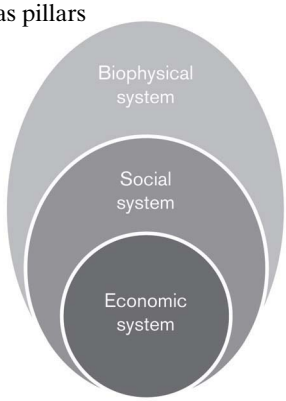

Figure 7. In contrast to the previous examples, this relatively frequent model emphasises a hierarchal relationship between the three standard dimensions, in that the environmental system constitutes the basis on which the social system can form, in turn forming a basis for the economic system.

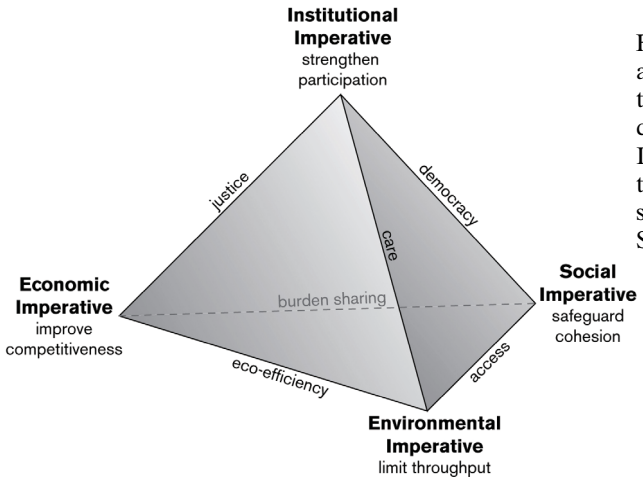

Figure 8. As an example of a four-dimensional model, the 'prism of sustainability', developed at the Wuppertal Institute, adds an institutional dimension to the standard triad. (Valentin & Spangenberg, 2000)

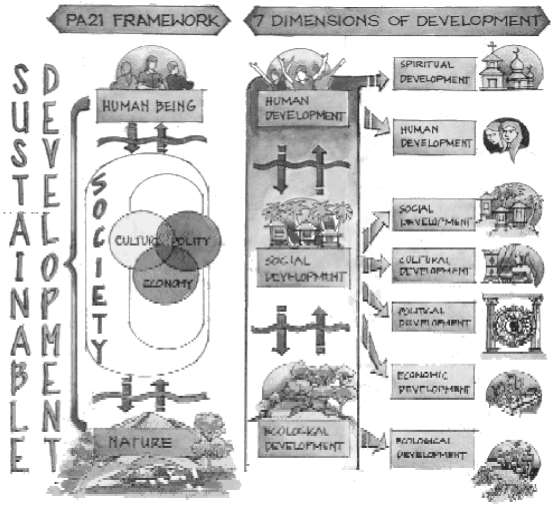

Figure 9. In this model, developed by a Philippine organisation, an alternative triad of main spheres – the human being, society and nature – is presented, ultimately diverging into no less than seven separate dimensions of development. (CADI, 2007)

Of the standard triad of sustainable development dimensions – environmental, social and economic – the social dimension is undoubtedly the most elusive and polysemous. Common conceptions of 'the social dimension of sustainable development' can be connected to several quite different principles. Analysing a number of conceptual models[7], I was able to identify at least five common lines of thought connected to 'social' or 'society' dimensions of sustainable development:

(a) the ethical imperative of meeting human needs and enhancing life quality;

(b) the ethical principle of equality;

(c) the idea of empowerment, citizen participation and democracy as a goal and as a means;

[7] For this purpose, I performed a document and web site survey on the Internet, listing and analysing 117 graphical models of sustainable development dimensions.

(d) the promotion of value preservation/development to build a culture of environmental awareness and respect for human rights, also connected to concerns about the necessity to strengthen collective identities, social networks and norms of reciprocity and cooperation; and

(e) the recognition of human capital as the foundation of society, emphasising health, education and opportunities for self-determination.

None of these conceptions clearly addresses 'social sustainability' in terms of sustaining social structures, something that has bothered critics of the indefiniteness of the sustainable development debate. Lélé (1991) asks why there is such an apparent lack of detailed analyses of the concept of social sustainability: "Perhaps achieving desired social situations is itself so difficult that discussing their maintainability is not very useful; perhaps goals are even more dynamic in a social context than in an ecological one, so that maintainability is not such an important attribute of social institutions/structures." It is quite clear that when social aspects of sustainable development are discussed, it is rarely a discussion about *sustaining* social structures. Instead, it is a matter of either more equal resource distribution or creating social structures which are more robust.

Social robustness, as defined here, will concentrate on social networks and informal social norms. These are issues normally associated with social capital discourse and mainly connected to the fourth line of thought (d) in the list above. The third line (c), about empowerment, participation and democracy, is also involved, as participation implies social networking in one way or another. Moreover, the fifth line (e) is involved as social relations after all depend on individuals. The two first lines in the list (a and b), however, are more connected to the needs perspective of sustainable development than to the robustness perspective.

Conclusions

This thematic paper has begun a theoretical elaboration on the question of how sustainable development can be interpreted in the context of tenant involvement in open space management. It has been argued that sustainable development is a well-established but intricate, and even contradictive, concept. To analyse it, it is necessary to separate it into two perspectives: needs and robustness. It must also be recognised that there are several possible needs and robustness perspectives, based on different ethical and ontological standpoints.

The needs perspective in the analysis involves the identification of stakeholders, of their needs, and of available and potential resources. Thereafter, the discussion concerns how the outcomes of the resources might be used to optimise needs satisfaction. This may seem like a relatively easy and hands-on calculation manoeuvre, but, as Max-Neef has discussed, needs satisfaction is a complex endeavour. What may appear to be a satisfier may sometimes even be destructive in the long run.

When it comes to tenant involvement in open space management, the primary stakeholders are the tenants and the needs in question could be conceptualised as good living conditions, comprising a multitude of desirable values

such as safety, enjoyment and health in connection to the resources, which comprise the physical as well as the social environment surrounding their dwelling. Important to note is that the tenants sharing a residential yard cannot be regarded as a homogeneous group but must be recognised as a collective of different individuals and groups with different, and perhaps oppositional, needs or aspirations.

Moreover, from a sustainable development point of view, needs satisfaction and resource usage must be analysed over a longer time and in terms of robustness, which is the second perspective. As described above, robustness concerns how a system develops over time in a dynamic and unpredictable environment. Robustness can be translated as a system's capacity to survive and thrive under changing and adverse conditions. This dissertation deals primarily with the neighbourhood system, which has physical as well as social components. The neighbourhood system in turn constitutes a subsystem of numerous larger-scale systems – e.g. it has a place in citywide or regional water distribution or waste recycling systems; its habitants are parts of nationwide cultural and political systems; it constitutes a habitat for plants, humans and other animals interacting in the global oxygen and carbon dioxide exchange system; etc. There are many possible ways to apply robustness analysis to a neighbourhood system, focusing on things like food security, technical supplies, economic viability and environmental impact. The main focus here has been on social robustness on a local level, i.e. how social relations, trust and social norms among tenants may contribute to robustness in the housing area they live in.

References

Adams, William M. (2001). *Green Development 2nd Edition: Environment and Sustainability in the Third World*. Routledge, London.

Albert, Réka; Jeong, Hawoong & Barabási, Albert-László (2000). "Error and attack tolerance of complex networks", in *Nature*, 406 (6794), pp. 378-381.

Berglund, Bengt (1997a). *Den oslagbara staden: ett robust samhälle med hög livskvalitet för alla*. Expertgruppen för säkerhet i förvaltning, ny- och ombyggnad, Överstyrelsen för civil beredskap, Stockholm.

Berglund, Bengt (1997b). *Grannskapet i den oslagbara staden: Rapport från ett seminarium med forskare och praktiker från olika kunskapsområden med inriktning mot framtidens robusta stad*. Expertgruppen för säkerhet i förvaltning, ny- och ombyggnad, Överstyrelsen för civil beredskap, Stockholm.

Berglund, Bengt; Flodin, Carl Erik & Larsson, Bo (2000). *Den oslagbara staden: robusthet på grannskapsnivå*. Expertgruppen för säkerhet i förvaltning, ny- och ombyggnad, Överstyrelsen för civil beredskap, Stockholm.

Berglund, Bengt & Larsson, Bo (1998). *Robusthet i den fysiska miljön*. Överstyrelsen för civil beredskap, Stockholm. [*Robustness in the physical environment*]

Brooks, Rodney A. (1986). "A robust layered control system for a mobile robot", in *IEEE Journal of Robotics and Automation*, 2 (1), pp. 14-23.

CADI (2007). "Figure 3. PA21, SIAD and the seven dimensions of sustainable development". Center for Alternative Development Initiatives. Retrieved 2007-11-27 from http://www.cadi.ph/SIAD_Poverty_Eradication.htm.

Castell, Pål (2009). *Collective gardening as a coping strategy for residents in deprived urban neighbourhoods: a literature review*. ENHR09, Changing Housing Markets: Integration and segmentation. Institute of Sociology, Academy of Sciences of the Czech Republic, 28 June - 1 July, 2009, Prague.

Collier, Paul; Elliot, V.L.; Hegre, Håvard; Hoeffler, Anke; Reynal-Querol, Marta & Sambanis, Nicholas (2003). *Breaking the conflict trap: civil war and development policy*. A World Bank policy research report. World Bank / Oxford University Press, Washington, DC.

Cruz, Ivonne; Stahel, Andri & Max-Neef, Manfred (2009). "Towards a systemic development approach: Building on the Human-Scale Development paradigm", in *Ecological Economics*, 68 (7), pp. 2021-2030.

Dobson, Andrew (1996). "Environment sustainabilities: an analysis and a typology", in *Environment Politics*, 5 (3), pp. 401-428.

Estes, Richard J. (1993). "Toward Sustainable Development : From Theory to Praxis", in *Social Development Issues*, 15 (3), pp. 1-29.

Fukuyama, Francis (1989). "The end of history?" in *The National Interest*.

Gibbons, Michael (1999). "Science's new social contract with society", in *Nature*, 402 (C81), pp. 11-18.

Goldsmith, Edward (1972). *A blueprint for survival*. Stacey, London.

Gunderson, Lance H. (2000). "Ecological resilience: in theory and application", in *Annual Review of Ecology and Systematics*, 31, pp. 425-439.

Hillier, Bill (1996). *Space is the Machine: A Configurational Theory of Architecture*. Cambridge University Press.

Holling, Crawford S. (1973). "Resilience and stability of ecological systems", in *Annual Review of Ecology and Systematics*, 4, pp. 1-23.

Holmberg, J.; Lundqvist, U.; Robèrt, K.-H. & Wackernagel, M. (1999). "The ecological footprint from a systems perspective of sustainability", in *International Journal of Sustainable Development and World Ecology*, 6 (1), pp. 17-33.

Hornborg, Alf (2002). "Tillväxt och teknikutveckling som ymnighetshorn eller nollsummespel", in Hedrén, Johan, (Ed.) *Naturen som brytpunkt : om miljöfrågans mystifieringar, konflikter och motsägelser*. B. Östlings bokförl. Symposion, Eslöv, pp. 332, [1]

Huber, Peter J. & Ronchetti, Elvezio M. (2009). *Robust statistics: second edition*. Wiley Series in Probability and Statistics. John Wiley & Sons, New York.

IUCN, International Union for Conservation of Nature and Natural Resources (1980). *World conservation strategy: living resource conservation for sustainable development*. IUCN, Gland.

IUCN, International Union for Conservation of Nature and Natural Resources (1989). *World conservation strategy for the 1990s (provisional title): rough first draft*. IUCN / WWF / UNEP, Gland.

Jamieson, Dale (1998). "Sustainability and beyond", in *Ecological Economics*, 24 (2-3), pp. 183-192.

Kain, Jaan-Henrik (2003). *Sociotechnical knowledge: an operationalised approach to localised infrastructure planning and sustainable urban development*. Doktorsavhandlingar vid Chalmers tekniska högskola. Ny serie, 1986. Chalmers University of Technology, Göteborg.

Kitano, Hiroaki (2002). "Systems biology: a brief overview", in *Science*, 295 (5560), pp. 1662-1664.

Langhelle, Oluf (1999). "Sustainable development: Exploring the ethics of 'Our Common Future'", in *International Political Science Review*, 20 (2), p. 129.

Lélé, Sharachchandra M. (1991). "Sustainable development: A critical review", in *World Development*, 19 (6), pp. 607-621.

Luthar, Suniya, S.; Cicchetti, Dante & Becker, Bronwyn (2000). "The construct of resilience: a critical evaluation and guidelines for future work", in *Child Development*, 71 (3), pp. 543-562.

Maslow, Abraham H. (1943). "A Theory of Human Motivation", in *Psychological Review*, 50, pp. 370-396.

Max-Neef, Manfred (1992). "Development and Human Needs", in Ekins, Paul & Max-Neef, Manfred, (Eds.): *Real life economics: understanding wealth creation*. Routledge, London, pp. 197-214

McLaren, Duncan (2003). "Environmental space, equity and the ecological debt", in Agyeman, Julian, et al., (Eds.): *Just Sustainabilities: Development in an Unequal World*. MIT Press, Cambridge

Meadows, Donella H.; Meadows, Dennis L.; Randers, Jorgen & Behrens, William W (1972). *The limits to growth: a report for The Club of Rome's project on the predicament of mankind*. Earth Island, London.

Merriam-Webster (2009). "Merriam-Webster OnLine". Based on Merriam-Webster's Collegiate Dictionary, Eleventh Edition. Retrieved 2009-01-10 from http://www.merriam-webster.com/.

Mies, Maria & Shiva, Vandana (1993). *Ecofeminism*. Zed Books, London.

Montin, Stig (1998). *Lokala demokratiexperiment: exempel och analyser*. Statens offentliga utredningar, 1998:155. Fritzes offentliga publikationer, Stockholm.

Munasinghe, Mohan (1993). *Environmental Economics and Sustainable Development*. World Bank Publications.

Munasinghe, Mohan (2001). "Exploring the linkages between climate change and sustainable development: a challenge for transdisciplinary research", in *Ecology and Society*, 5 (1).

Myrdal, Janken (1997). "En agrarhistorisk syntes", in Larsson, Bengt M.P., et al., (Eds.): *Agrarhistoria*. LTs Förlag, Stockholm

O'Riordan, Timothy (1993). "The Politics of Sustainability", in Turner, R. Kerry, (Ed.) *Sustainable environmental economics and management : principles and practice*. Belhaven Press, London/New York.

Pintér, László; Hardi, Peter & Bartelmus, Peter (2005). *Sustainable development indicators: proposals for a way forward*. UN-DSD, United Nations Division for Sustainable Development, New York.

Risk, Michael (2006). “Resiliency, sustainable development, etc.” Coral Health and Monitoring Program, National Oceanic and Atmospheric Administration. Retrieved 2008-10-21 from http://coral.aoml.noaa.gov/pipermail/coral-list/2006-March/034517.htm.

Sayre, Nathan F. (2008). “The genesis, history, and limits of carrying capacity”, in *Annals of the Association of American Geographers*, 98 (1), pp. 120-134.

Serageldin, Ismail (1994). “Making development sustainable”, in Serageldin, Ismail & Steer, Andrew D., (Eds.): *Making development sustainable: from concepts to action*. World Bank, Washington.

Spangenberg, Joachim .H. (2002). “Environmental space and the prism of sustainability: frameworks for indicators measuring”, in *Ecological Indicators*, 2 (3), pp. 295-309.

Swedish Government (1991). *Vidga brukarinflytandet: en väg till ökad delaktighet och bättre service (Widen the users’ influence: a path to increased involvement and better service)*. Ds : departementsserien, 1991:18. Civildepartementet. Allmänna förlaget, Stockholm. [*Widen the users’ influence: a path to increased involvement and better service*]

Swedish Government (1997). *Självförvaltning (Self-management)*. Governmental proposition 1996/97:119, Stockholm. [*Self-management*]

Swedish Government (2000). *En uthållig demokrati!: Politik för folkstyrelse på 2000-talet: Demokratiutredningens betänkande*. Statens offentliga utredningar, SOU 2000:1. Fritzes, Stockholm. [*A sustainable democracy!: Politics for public rule in the 21st century: final report of the Commission on Democracy*]

Talberth, John; Cobb, Cliff & Slattery, Noah (2007). *The genuine progress indicator 2006: a tool for sustainable development*. Redefining Progress, Oakland.

UNCED, United Nations Conference on Environment and Development (1992). *Agenda 21*. United Nations, New York.

UNDSD, United Nations Division for Sustainable Development (2001). *Indicators of sustainable development: Guidelines and methodologies*. Department of Economic and Social Affairs, United Nations, New York.

Valentin, Anke & Spangenberg, Joachim H. (2000). “A guide to community sustainability indicators”, in *Environmental Impact Assessment Review*, 20 (3), pp. 381-392.

Walter, Barbara F. (2004). “Does conflict beget conflict? Explaining recurring civil war”, in *Journal of Peace Research*, 41 (3), pp. 371-388.

WCED, World Commission on Environment and Development (1987). *Our common future*. Oxford University Press, Oxford.

Wheeler, Stephen M. (2004). *Planning for sustainability: creating livable, equitable, and ecological communities*. Routledge, New York.

Wide, Jessika & Gustafsson, Gunnel (2001). *Lokal demokrati i förändring: medborgerliga och kommunala initiativ under nya villkor: en översikt*. Àjour, nr. 6. Svenska Kommunförbundet, Stockholm.