

UFZ Discussion Papers

6/2011 - GeNECA 2

Ecosystem effects on well-being: more than just “benefits”? Looking at ecosystem services through the capability approach

Yuliana Polishchuk, Felix Rauschmayer

October 2011

**Gerechte Nachhaltige Entwicklung auf Grundlage des Capability-Ansatzes
(Fair sustainable development based on the capability approach):**

GeNECA

‘Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs.’ (WCED 1987)

Aims and objectives of the research project GeNECA

Sustainability policy has to consider the interdependencies of human life and nature; it has to meet the high moral standards of intra- and intergenerational justice set by the Brundtland Commission in 1987; and, finally, it has to motivate people to behave accordingly. This is quite a challenging task that often is responded to in a too simplistic way. Current sustainability science and civic engagement often focus on the environmental dimensions and herewith on intergenerational justice.

The Capability Approach is a leading paradigm in development economics that has informed development policy during the last 20 years. With its focus on human development it has highlighted the interaction between social and economic development. The issue of intragenerational justice constitutes an ongoing motive within the Capability Approach, but intergenerational justice and environmental concerns have often been left out of its scope.

The project GeNECA aims at conceptualizing sustainable development on the basis of the Capability Approach so as to combine the issues of inter- and intragenerational justice drawing on an integrated understanding of social, economic and environmental development. Resuming the spirit of the Brundtland commission, GeNECA puts the needs and capabilities of people all over the world, now and in future into its focus.

On the basis of conceptual reflections, current sustainability indicators will be complemented by capability-based indicators. The concept will further be used in case studies on various areas of governance to prove its usefulness in decision processes. A feedback mechanism will be installed to amend the conception to the demands of applicability.

GeNECA is a 3 years research project (04/2010-03/2013) funded by the German ministry for science and research as part of the funding programme "Economics for Sustainability". (FKZ 01UN1015A, www.wi-n.org)

Coordination

Dr. Felix Rauschmayer UFZ, Dpt. of Environmental Politics, Permoserstr. 15, 04318 Leipzig, Germany, ph. 0049 (0)341 235 1656, e-mail: felix.rauschmayer@ufz.de

Consortium

- Helmholtz Zentrum für Umweltforschung, Leipzig (UFZ)
- Deutsches Institut für Wirtschaftsforschung Berlin (DIW)
- Institut für angewandte Wirtschaftsforschung (IAW)
- Ludwig-Maximilians-Universität München (LMU), Fakultät für Philosophie
- Helmut-Schmidt-Universität der Bundeswehr Hamburg (HSU)
- Sustainable Europe Research Institute Wien (SERI)

<http://www.geneca.ufz.de>

Ecosystem effects on well-being: more than just “benefits”? Looking at ecosystem services through the capability approach

Yuliana Polishchuk¹, Felix Rauschmayer

Yuliana Polishchuk, Helmholtz Centre for Environmental Research (UFZ), Permoserstr. 15, 04318 Leipzig, Germany; yuliana.polishchuk@ufz.de

Felix Rauschmayer, Helmholtz Centre for Environmental Research (UFZ), Permoserstr. 15, 04318 Leipzig, Germany; felix.rauschmayer@ufz.de

Abstract²

Conceptual discussions on the impacts of ecosystem services (ESS) on human well-being have largely been boiled down to limits and applications of their monetisation. Therefore, in practice, the use of the ESS concept has been to a large extent boiled down to payment-for-ecosystem-services schemes. In this paper we argue that the human well-being dimension of the ESS concept has to be revisited since it is more diverse than the widely cited notion of “benefits” (MA, 2005). To tackle this issue, we examine the ESS concept through the lens of the capability approach, which offers a pluralistic framework for well-being as an alternative to mainstream utilitarian or monetary perspectives. We argue that ESS can effectively be viewed as contributing – in different ways – to people’s multidimensional capability sets, i.e. their freedoms to lead a life they have reason to value. Such a view allows us to go beyond currently prevailing utilitarianism in analysing effects of ecosystems on human well-being, thus contributing with a new perspective to the current discourse on the use of the ESS concept.

¹ Corresponding author. E-mail address: yuliana.polishchuk@ufz.de.

Tel.: +49 (0) 341 235 1681

Fax: +49 (0) 341 235 1836

² This paper has been submitted for publication in the journal "Ecological Economics".

1. Introduction

One of the recent trends in the ecological economics literature has been the increased attention to the concept of ecosystem services (ESS), commonly understood as the benefits people obtain from ecosystems (MA, 2005). Initially the ESS concept was introduced in the early 1980-s with the “pedagogic” purpose of explaining to non-ecologists human dependence on functioning ecosystems (Gomez-Baggethun et al., 2010). However, it became soon associated with monetary valuation and with increasingly popular “payments-for-ecosystem-services” (PES) schemes (Engel et al., 2008; Wunder et al., 2008). A remarkable part of the recent debates have focused on whether the ESS concept can be an appropriate tool for nature conservation (McCauley, 2006; Spash, 2008) and the questions of when and how monetising approaches could be employed as a way including the value of nature in societal decision-making processes (e.g. Kumar, 2010). Meanwhile discussions on the clearly anthropocentric concept of ESS have lacked a thorough elaboration in terms of exactly in what ways ecosystems’ contribution to people’s well-being can be perceived, how human well-being is conceptualised, and to what extent the notion of “benefits” is in fact appropriate for describing the positive effects that ecosystems have on human beings.

Current debates on ESS tend to become dialectical, essentially focusing either on fundamental issues, such as intrinsic vs. instrumental values of nature (e.g. Armsworth et al. 2007; see also Minter and Miller, 2011), or on strategic issues, such as the apparent preference given in political debates to monetising approaches and the related advantages and/or drawbacks (McCauley 2006). More nuanced and balanced statements, such as those developed in the theoretical foundations of “The Economics of Ecosystems and Biodiversity” – TEEB (Kumar, 2010) – are often neglected in the public debate in favour of clearer positions pro and contra monetisation (Sagoff, 2011; McCauley, 2006). In this light, the main motivation behind the present paper is in line with Norgaard’s (2010) recent call for developing a richer perspective on societal relationships with nature. In the following, we will introduce another perspective into the debates, grounded in the capability approach, which has been addressing human well-being both on theoretical and practical grounds for some decades now.

We employ the capability approach as a framework for analysing effects of ecosystems on human well-being. In contrast to utilitarian and opulence approaches, the capability approach views human well-being in terms of capabilities and (achieved) functionings, or people’s *freedoms* to lead a life they have reason to value and their actual *achievements* (Sen, 1999). As both the capability approach and the ESS concept are multidimensional and centred on human well-being, exploring the ESS concept through the

capabilities lens allows us to address relationships between ESS and well-being on a qualitatively new basis. We believe that bringing this perspective opens up a richer debate on the human dimension of the ESS concept, as well as points to new potential areas for the application of the concept.

The rest of this paper is structured in the following way. Firstly, we will set the stage for our argument. Namely, we will elaborate on the ESS concept and cover some of the current debates around it, then reflect on the basic framework for addressing linkages between ESS and human well-being as proposed by the Millennium Ecosystem Assessment (2005), and lastly, introduce the capability approach as an alternative theoretical framework for analysing human well-being. As a subsequent step, we will propose a way of examining the ESS concept through the lens of the capability approach. Finally, we will draw some implications of the proposed perspective for the current debates on ESS.

2. Theoretical background

2.1. The ESS concept and current debates around it

The concept of ESS, coined in the 1980s in the writings of Ehrlich and Ehrlich (1981) and Ehrlich and Mooney (1983), was designed as a way of demonstrating how biodiversity loss affects ecosystem functions and ultimately human well-being (Gomez-Baggethun et al., 2010). Since the late 1990-s, the notion of ESS has been increasingly employed by academics, researchers, and policy-makers, particularly with the vital contributions by Daily (1997) and Costanza et al. (1997). The publication of the major international study *Millennium Ecosystem Assessment* in 2005 “finally brought the concept broadly into public policy” (Jax, 2010: 66), having illustrated the multifaceted benefits that humanity obtains from ecosystems all over the world and the related current threats to ecosystems.

One should point out that no single definition of ESS has been unanimously accepted, although all existing versions point to the positive contribution of ESS to human well-being³. It is possible to distinguish between two major variations of ESS definitions: an ecological and an economic one (Jax, 2010). Thus, Daily (1997: 3) provides an early definition of ESS that is based on ecological characteristics. According to it, ESS can be understood as “the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life”. Here, ESS embrace the categories

³ In this paper, we will focus on the “positive” services and will not address the negative impacts of ecosystems in the form of “disservices” such as diseases spread by wetland mosquitoes, wetland odours, etc.

of: 1) ecosystem goods, such as timber, biomass fuel, forage, pharmaceuticals, etc., 2) ecosystem functions, for instance, water purification, flood mitigation, (partial) climate stabilisation, pollination and many others, and 3) aesthetic and cultural benefits (ibid: 3-4). We will come back to this definition with a few remarks below.

Another, “economic” or benefit-based, definition of ESS was suggested by the Millennium Ecosystem Assessment (MA), a major international study carried out through 2001-2005. Here, ESS are understood as “the benefits people obtain from ecosystems” (MA, 2005: 26). Following the MA (2005), ESS can be classified into the following categories: provisioning, regulating, cultural and supporting services. This famous classification, complemented by linkages to various elements of well-being, is presented in Figure 1.

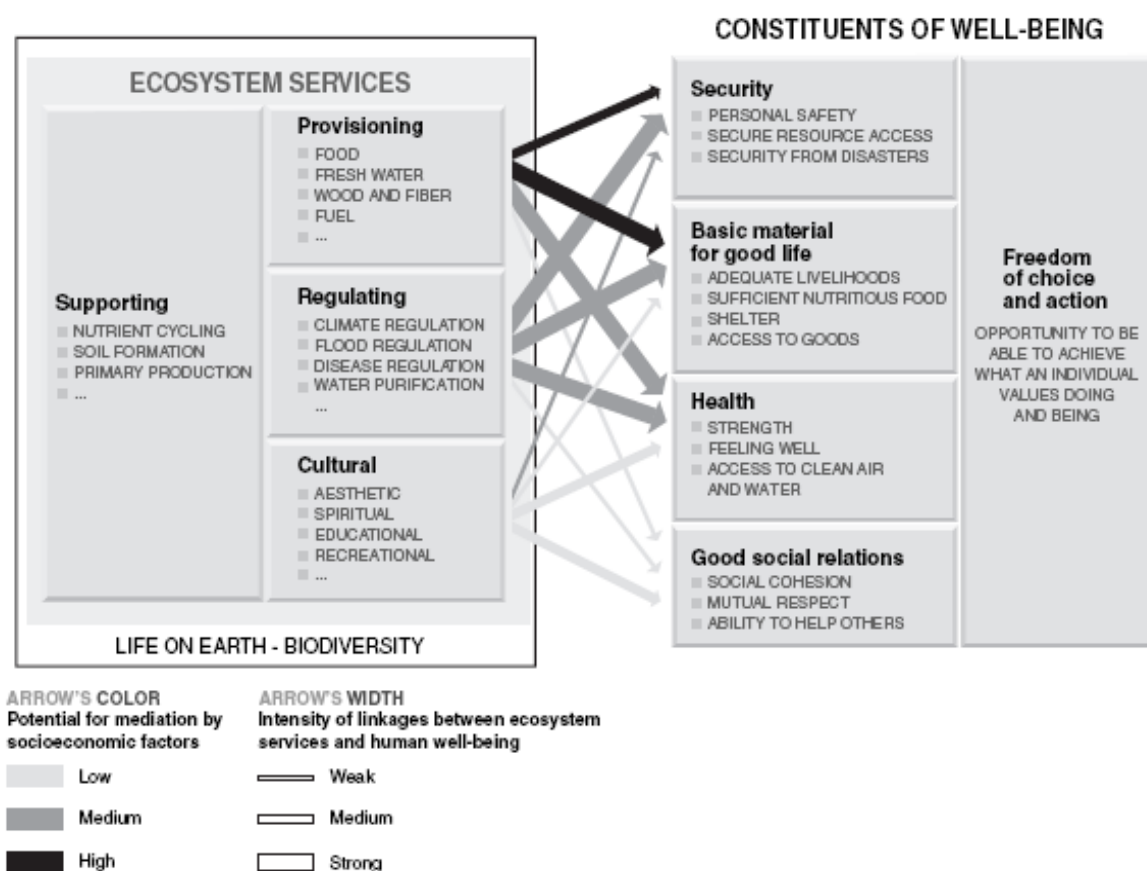


Figure 1. Linkages between ecosystem services and human well-being

Source: MA, 2005: 28

In the cited classification, provisioning services are the material benefits derived from ecosystems, such as fresh water, raw materials, food (which can be split up into a number of more specific subcategories like agricultural crops, game, fish, berries and mushrooms, etc.), as well as genetic, medicinal, and ornamental resources. Regulating services, as the name suggests, regulate processes important for human functioning and flourishing and embrace

air quality regulation, erosion prevention, climate regulation, (natural) flood mitigation, moderation of extreme events, etc. Further, cultural services relate to recreation, spiritual and religious values, educational information and other ecosystem contributions of this kind. Finally, supporting ecosystem services support the production of other ESS and include primary production, nutrient cycling, photosynthesis, etc. This type of definition and the accompanying classification has been picked up all over the world and is often cited when it comes to topics dealing with ESS. We will work with the MA definition as well, taking into account its widespread use in the relevant literature and its clear human-centeredness, which is appropriate in the present context.

Analysing the MA classification of ESS, one can notice that the first three groups of ESS – provisioning, regulating, and cultural – refer to direct contributions of ecosystems to human well-being, whereas supporting ESS *underlie* these groups of ESS, securing their provision and thus referring to deeper ecological processes. In this light, for example, a recent international study called “The Economics of Ecosystems and Biodiversity” – TEEB (Kumar, 2010) – omits supporting ESS as a category (adopting instead the service of habitat provisioning). Not engrossing in these debates, we intentionally limit the scope of our argument to the three “consensual” groups of ESS – provisioning, regulating, and cultural services – due to the specific focus on well-being effects of ecosystems. By no means do we herewith wish to exclude supporting ESS from the analysis of how best to secure ESS-induced well-being: their contribution is important at a *fundamental* level, thus being indirect and difficult to link to human well-being and capabilities.

A number of divergent ESS definitions have emerged in a variety of contexts. They reflect such issues as the concept’s universality vs. its context-dependence, double counting (especially relevant for supporting and regulating ESS), relationships between the categories of services and ecological processes and structures, etc. (see Kumar, 2010; Jax, 2010; Farley and Costanza, 2010, etc.). A variety of ESS definitions and some conceptual limits have been scrutinised and summarized, among others, by Lamarque et al. (2011), who attempt to locate ESS within the broader framework of nature’s contributions to human well-being. These authors clarify, for instance, the notions of ecological, environmental, landscape, and ecosystem services⁴ and shed light on the often unclear (at least for non-

⁴ Often these terms are used interchangeably (de Groot et al. 2010, Lamarque et al. 2011); however, sometimes the same concepts are applied differently. Thus, the term “ecological services” might imply services provided by a certain species or group of species rather than an ecosystem on the whole (Lamarque et al. 2011). Environmental services, in turn, sometimes imply “human-made services, which totally or partially substitute ecosystem services” (e.g. water and waste management services; Lamarque et al: 2). Primarily, however, the notions of environmental and ecosystem services are used interchangeably, especially with reference to payment-for-ecosystem-services schemes. Landscape services, finally, in some cases refer to those stemming from a certain landscape, region, or a land-use system rather than from an ecosystem (ibid.).

ecologists) boundaries between the concepts. Whereas the political importance of these differentiations might not be evident at first sight, they become relevant when it comes to the use of the ESS concept for the politically relevant goal of biodiversity protection.

When talking about applications of the ESS concept, the already notorious PES schemes have probably received primary attention in policy-making circles (for a comparison of PES schemes in developing and developed countries, see e.g. Wunder et al., 2008). Beyond that, valuation studies like TEEB – The Economics of Ecosystems and Biodiversity (www.teebweb.org) – offer information on ESS for decision-makers and other stakeholders at various governance levels world-wide. The chief idea of TEEB is to illuminate the value of nature through identifying both monetary and non-monetary values of the different “services” provided by ecosystems. These established values – compared to non-valuation – demonstrate the necessity and economic rationality of conserving biodiversity, which secures provisioning of ESS and is considered worldwide to be of high intrinsic value (MA, 2005; CBD 1992).

At the same time, the “appropriateness” of the ESS notion for the goal of biodiversity conservation has become subject to scrupulous attention and often heavy critique of both ecologists and economists (see, for example, McCauley, 2006; Norgaard, 2010). One crucial argument coming from an ecological perspective is that there is much more to biodiversity than solely ESS (e.g. Jax, 2010), whereas from an ecological economics perspective, the commodification of nature through putting price tags on ESS has become a burning topic (e.g. Gomez-Baggethun et al., 2010). While such inarguably decisive debates are continuing, we consider it absolutely essential to step back and revisit the “grounding stones” of the ESS concept, which should provide important foundations for discussing issues related to the concept use.

2.2. *Looking at the well-being dimension of ESS through the MA lens*

In the light of ongoing debates about the use of the ESS concept and continuing implementation of PES schemes in different parts of the globe (Wunder et al., 2008; Daily et al., 2009), we propose to turn our attention to the often neglected well-being dimension of the ESS concept, which comprises an indispensable part of it. In other words, we suggest scrutinising the concept of ecosystem services from the perspective of human well-being and the associated “benefits”, as initially put in the Millennium Ecosystem Assessment (2005). We believe that this angle can illuminate some specificities of the concept which are crucial for understanding its goals, scope and possible applications areas.

Selecting a theoretical lens is essential for examining the ESS concept and analysing

its role in the relevant implementation programmes, since it lays the foundation for ideas about how the concept can/should be applied in practice. To approach this task, let us have a look at some major framings for ESS that have been suggested so far.

The MA (2005) and Costanza et al. (1997) define ESS in terms of “benefits that people obtain from ecosystems”, whereas Daily et al.’s (1997) refer to the ESS characteristic of “sustaining and fulfilling human life” (1997: 3). Thus, all these sources point to the importance of the human “component” regarding human-nature relationships reflected in the ESS concept. Particularly in the MA and Costanza et al.’s definitions and classifications, the central role of human interests in identifying ESS based on the benefits for people is highlighted. As follows from the ESS definitions, it is the people who decide on what fulfils their life and what constitutes the “benefits” derived from ecosystems. The characteristics and products of ecosystems which do not currently meet the requirement of being “important” or desirable are not included in the existing framework. However, we are not going to criticise either this aspect or the legitimacy of using the ESS concept in biodiversity conservation and other existing implementation practices: this has been done often enough (see e.g. McCauley, 2006; Gomez-Baggethun et al., 2010). Rather, we explore the concept as it has evolved so far and attempt to add some flesh to its “human dimension”, starting with the question of how we actually conceptualise well-being and proceeding to the issue of how ESS can contribute to it.

To begin with, let us have a second look at how the major study on ESS and well-being – the Millennium Ecosystem Assessment – tackles this task (see also the discussion in Section 2.1). The MA version of the ESS definition as “the benefits people obtain from ecosystems” has been taken up by scholars and policy-makers all over the world. In line with this, the graphical representation of the four ESS categories – provisioning, regulating, cultural and supporting services – along with their linkages to various elements of well-being (see **Figure 1**) has been widely cited.

While it is obvious that ESS are important for human well-being, relationships between them and various specific aspects of well-being require more scrutiny. The MA (2005) depicts its vision of these relationships in **Figure 1**. Here, five aspects are identified as components of well-being: security, basic material for good life, health, good social relations and the freedom of choice and action, the last one being an overarching component based on the previous four. It should be noted that the MA understanding of well-being is normatively charged, regarding both the selection of categories and the specific wording, e.g. “good social relations” and “basic material for good life”. Linkages between three groups of ESS (excluding supporting ESS) and each of the first four components of well-being are depicted as one-way arrows, the colour and width of which show the corresponding potential

for mediation and intensity of the linkages. The measurement of ESS and their translation into societal decision-making processes through ecological indicators or monetary values remains thereby “hidden” behind these arrows. (The TEEB study substantiates these linkages and provides guidelines on how to measure ESS and embed them in the decision-making processes: see Kumar, 2010; Wittmer, 2012).

The MA representation, demonstrating linkages between ESS and the first four components of well-being, leaves out connections to the fifth well-being component, namely “freedom of choice and action”. Meanwhile this aspect appears particularly important especially with regard to Sen’s capability approach (which will be elaborated on in Section 2.3). Freedom of choice and action is interpreted in the MA as the “opportunity to be able to achieve what an individual values doing and being” (MA, 2005: 28), which echoes the notion of capabilities. The absence of explicit linkages between ESS on the one hand and freedom of choice and action on the other hand appears to be an important shortcoming from the capabilities perspective. Whereas the impact of ESS on people’s freedom of choice and action is implicitly acknowledged through other constituents of well-being, people’s freedoms and actions also affect ESS, *inter alia* through their environment-related decisions. This feedback loop could importantly complement the picture by showing how human choices affect the state of ESS and the associated ecosystem trends.

Furthermore, one could certainly discuss the MA list of constituents of human well-being affected by ESS. Whereas fundamental needs (e.g. security) and the social context (good social relations) are addressed, other important elements of well-being, such as, for instance, issues related to personal development, could be explicitly mentioned as well. One might question to what extent the MA list would reflect locally identified constituents of ecosystem-related well-being in each specific case. In this regard, it is crucial to consider who defines the issue: one should be careful with possible overreliance on scientific expertise and underestimation of the human dimension (as pointed out by Menzel and Teng, 2009 for the case of ESS). Stakeholder participation, as acknowledged by the MA and characteristic of their sub-global assessments (MA, 2005), is required on both sides, with regard to both defining the relevant ESS *and* those constituents of well-being that make one’s life valuable. To resume: the MA definition of human well-being, while representing a multidimensional framework, still lacks the theoretical background for selecting specifically these five dimensions of well-being, as well as the explication of their interrelations with various ESS.

Finally, the MA (2005) representation depicts the impact of individual ESS on the various components of human well-being, but how are these impacts mediated by personal

and societal circumstances? In other words, how do ESS translate into the constituents of well-being for a certain individual? Merely showing that there is a strong linkage between, say, the provisioning service of fuel and basic material for good life is not enough when addressing the issue of ecosystem-dependent well-being in a specific context. Such a representation conceals effects of individual factors influencing ESS use, as well as possible conflicts and trade-offs between various actors: for instance, between those aiming to derive monetary benefits from the ecosystem and those dependent on it for their livelihood (among other factors, scale issues have to be considered). Particularly in the case of provisioning and cultural ESS, an MA-type framework of direct linear linkages between ESS and well-being components does not allow an evaluation of the actual benefits that people receive from ecosystems because everyone has an own way of “converting” them into the factors of personal well-being. For example, the provisioning service of game, which might in a certain context be crucial to achieving the functioning of being well nourished, cannot to the same extent be enjoyed by a physically fit person as by a disabled one. Moreover, this specific ESS would imply different benefits for a vegetarian compared to a meat gourmand. Therefore it is indispensable that the context is considered prior to establishing linkages between ecosystem services and the respective capabilities in each particular case.

In this light, we aim to tackle the task of addressing the well-being side of the ESS concept by employing the capability approach as a theoretical framework for embracing the ESS concept in its human well-being dimension.

2.3. The capability approach as a framework for addressing human well-being

In this section we aim to elaborate on the essentials of the capability approach (CA) and to specify why it appears to represent an appropriate framework for framing the ESS concept. Let us start with the key specificities of the CA.

The CA was founded and further developed by the economist and philosopher Amartya Sen as a critique to standard welfare economics, but also with the aim of proposing an alternative method for policy evaluations. Despite the difficulties related to operationalisation of this inherently multidimensional approach (see Comim, 2008), multiple studies apply the CA, even though often in an oversimplified way (see Leßmann, 2011 for an overview)⁵.

In what ways is the CA different from the more mainstream approaches? In its core,

⁵ The Human Development Index, which is yearly published in the UN Human Development Report, is certainly a prime example for the high political impact of capability ideas, but also for high simplification of the CA.

the CA rejects both preoccupation with monetary indicators of well-being and the purely utilitarian views on well-being. Concerning the first point, Sen (1999) advocates that income on its own, or the resources available to the person, cannot be taken as an indicator of well-being because other aspects (e.g. rights and liberties) are important as well. Since the same resources in reality correspond to various “levels” of well-being, reflecting people’s diversity and their specific circumstances, they can be at best considered as *means* to achieving certain well-being goals, but not as *ends* or indicators of well-being. For an adequate assessment of one’s well-being, aspects beyond income have to be considered as well.

With regard to the second point, namely the critique of utilitarian approaches, Sen (1999) advocates that utility measured by mental satisfaction (in contemporary economics mostly reflected through revealed preferences) represents a poor measure of well-being for a number of reasons. One of them goes back to the issue of adaptive attitudes: continuously deprived and oppressed people living in poor areas might report a high level of utility because they simply get used to the surrounding conditions over time, even though their rights and opportunities are objectively being restricted. Another point of criticism relates to the so-called creative discontent, which may in fact lead to improved well-being but creates a distorted picture when analysed within the utilitarian framework of mental satisfaction. The third point is connected to the monism of utilitarianism, which fails to reflect the richness of what can constitute an ethical good (Sen, 1987). Substantially, utilitarianism receives Sen’s strong criticism for its “indifference to freedoms, rights and liberties” (Sen, 1999: 57) by taking utility as its informational base.

In turn, CA adherents insist that it is “the opportunity to live a good life, rather than the accumulation of resources, that matters most for well-being” (Anand et al., 2005: 10). The “good life” in the CA is constituted by a vector of *functionings*, i.e. a multidimensional combination of “doings” and “beings” people have reason to value, e.g. ‘being educated’, ‘participating in community life’, ‘having self-respect’ and many others (CA authors often speak of *achieved functionings* – see Robeyns, 2005; Clark, 2008; Sen, 1999 for terminological issues). Well-being, in turn, goes beyond the notion of a “good life”, as it also includes the *freedom* to achieve such functionings – whether actually chosen or not. Single freedoms, such as ‘being able to be well nourished’, ‘being able to receive education’, ‘being able to express one’s mind freely’, etc., refer to capabilities and altogether constitute the person’s capability-set⁶. Accordingly, the ultimate goal of human development within the

⁶ To stay terminologically clear, one should mention that the focus of the capability approach goes beyond exclusively individual’s *own* well-being by including the aspect of *agency*, which embraces non-self-regarding goals and actions (i.e. commitments) (see Grasso and Giulio, 2003; Robeyns, 2005). However, in this work we

capabilities framework is human flourishing, which can be reached through the enhancement of the capability set (Sen, 1999).

How can capabilities be enhanced and what are the factors that affect capability formation? In contrast to opulence-based approaches, in the CA goods and services available to an individual do not correspond to a certain level of well-being. Rather, they are valuable for the person to the extent that they affect his or her capabilities and ultimately serve to achieve functionings. This means that specific conditions have to be considered in which the person can actually make use of the available goods and services. From a CA perspective, the goods and services available to the person become “converted” through a set of *conversion factors* before their effects on one’s capabilities can be distinguished (following Robeyns, 2003, 2005). (Interestingly, such a distinction echoes the categories of *resources* and *conditions* used in ecology.) Conversion factors in the CA can generally be divided into three groups, reflecting the environmental and social context in which people live, as well as their personal abilities, characteristics, and history.

The first group embraces *personal* conversion factors, which reflect how a certain person converts goods and services into capabilities based on her own (bodily, mental, etc.) abilities. For example, having a bicycle (a good) only leads to Nancy’s capability to move around freely if she is able to ride it. The second group comprises *social* conversion factors, such as social practices, power relations, gender roles, caste relationships, etc. Following the previous example, it should be socially acceptable for Nancy to ride a bicycle on her own, without being accompanied by a male member of the society, in order for her to have the capability of being mobile. Finally, the third group is represented by *environmental* conversion factors, which can enhance or impede capabilities via conditions such as geographic location, climate, clean air, etc. In Nancy’s case, with heavy traffic or in extreme temperatures, her capability of moving around is restricted due to the respective environmental conditions. In this way through the notion of conversion factors the CA allows considering factors beyond available goods and services which influence people’s capabilities and herewith their achieved functionings (Robeyns, 2005).

The third group of conversion factors – environmental ones – appears of particular interest when examining how ESS can be understood from a CA perspective. This issue will be taken up in the following section of this paper.

will restrict the analysis to the notion of well-being, following the established literature on ESS (such as MA, 2005; TEEB, 2010, etc.).

3. The capability approach and ecosystem services: a conceptual incorporation

In this section we will show how ESS can be understood within the CA framework for well-being. However, before proceeding to this issue, one should mention that so far the relationships between humans and the natural environment have not received primary attention in the CA. As put by Sneddon et al. (2006: 262), “if there is one noticeable gap in Sen’s analysis, it is the lack of concern with the environment and ecological changes”. More recent literature on the links between nature and the CA comprises works of Holland (2008), Scholtes (2010), Ballet et al. (2011), and Rauschmayer and Lessmann (2011), but none of these tries to conceptualise how nature impacts on individual well-being. However, we see conceptual space for addressing nature’s effects on human well-being within the CA. To explore this issue in detail, let us have a look at the figure presented by Ingrid Robeyns (2005: 98), showing how a person’s capability set is formed (see **Figure 2**).

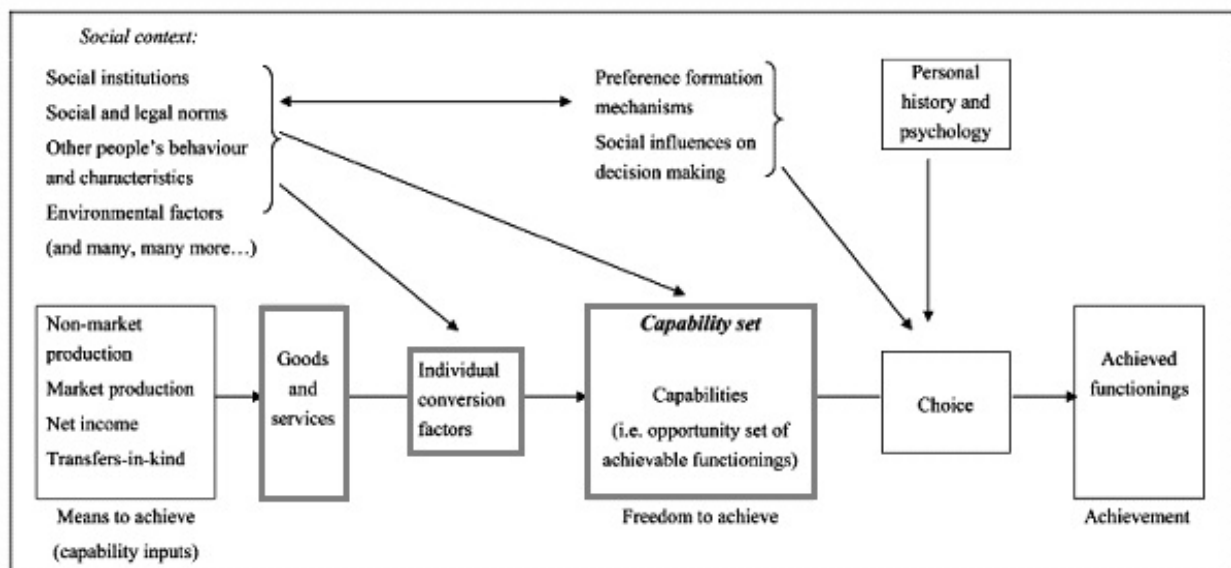


Figure 2. A stylised non-dynamic representation of a person’s capability set and her social and personal context

Source: adapted from Robeyns, 2005: 98

This figure illustrates how the specific elements that impact capabilities and ultimately achieved functionings, such as goods and services, social institutions, personal history, etc., relate to each other. However, as the title of the diagram suggests, only social and personal contexts are considered here, whereas the environmental context is missing. (Where the environmental component is *implicitly* present in the picture is under the title “individual

conversion factors” – however, not separately distinguished. Environmental factors under the heading of “social context” refer rather to the “non-natural” aspects such as infrastructure: see Robeyns, 2003, 2005). Meanwhile factors of the natural environment obviously play a vital role in shaping people's capability sets and therefore have to be explicitly accounted for.

In this context, the concept of ESS comes in handy. On the one hand, it suggests how the environmental dimension of the capability approach can be improved: namely, by introducing the well-being effects of ecosystems into the framework. On the other hand – and this is the main focus of our argument – placing the ESS concept into the capabilities framework illuminates the role(s) of ESS in capability formation, leading to a more comprehensive understanding of the well-being dimension of the ESS concept.

Let us now see how the three groups of ESS – provisioning, regulating, and cultural – relate to the key elements of the presented capabilities model: goods and services on the one hand and conversion factors on the other hand. First of all, it is crucial to specify what exactly fits into the category of goods and services and how these are different from conversion factors, particularly with regard to the (natural) environment. Whereas little to no guidance has been provided concerning the conceptual “demarcation line” between goods and services on the one hand and conversion factors on the other hand (e.g. Robeyns, 2005), let us go through the groups of ESS and examine how they can be linked to the existing CA categories in accordance with the possible roles of ESS in capability formation.

As specified by Robeyns (2003), goods (and services) are of interest to us because of their specific characteristics which enable certain functionings. Thus, firstly, all ESS can be seen as goods and services in the CA sense. To start with the clearest case, provisioning ESS, such as fresh water, wood, and medicinal herbs, could enter the capabilities model as goods. Further, regulating ESS can be placed into this category as well: many of them correspond to the functions that human-made plants and appliances provide, such as water purification, sewage treatment, etc. Finally, cultural ESS can also be included in the “goods and services” category: aesthetic information, inspiration for art and poetry, etc. offered by ecosystems are alternatively provided by theatres, opera houses, art galleries, etc., which are considered to be services in the common economic sense.

All these types of ESS influence people's capabilities – however, not in a one-to-one relationship. For example, a walk in the city park (related to a range of cultural ESS) can bring diverging educational and recreational benefits to representatives of different social strata, depending on the social attitudes towards certain social groups, to people with and without a migration background, etc. Hence, the real well-being effects of cultural ESS cannot be concluded on a general level because people convert the services provided by

ecosystems on an individual basis via a range of conversion factors. Overall, when evaluating the contribution of ESS to capabilities, one should consider the sets of personal, social, and environmental conversion factors relevant in each particular case. In neoclassical economics, such a conversion is implicit in every individual valuation: a person is considered to be able to rationally assess his or her individual benefit drawn from a specific ESS without conceptualising it via personal, social, or environmental conversion factors. The result of such a valuation, though, is usually mono-dimensional (e.g. utility expressed in monetary terms), whereas the CA conception of human well-being is inherently pluralistic, referring to the evaluative space of diverse capabilities and functionings irreducible to each other.

Secondly, ESS should be explored in their relationship to the three groups of conversion factors: personal, social, and environmental. Taking into account that regulating ESS create, affect or maintain many of the conditions of the natural environment (e.g. climate, quality of soil, amount of rainfall, etc.), they fit well into the category of environmental conversion factors, impacting on the way people put available resources into use. For example, Nancy's plot of land (i.e. a "good") does not in itself enable a pre-defined range of capabilities for her. However, taking into account regulating ESS such as erosion prevention and flood regulation, among other factors, helps to assess the extent to which this land enhances Nancy's capabilities in reality (being able to grow vegetables on the land, being able to sell the land for a high price, etc.). In this way, regulating ESS "convert" available goods and services into the actual capabilities and can therefore be seen as (a subgroup of) environmental conversion factors. At the same time it should be pointed out that regulating ESS also affect personal conversion factors such as health. This transcends their role beyond that of goods and services and introduces dynamics into the model.

Furthermore, cultural ESS can be viewed as environmental conversion factors in the capabilities model as well. They create conditions for people to put the available resources into use, e.g. by providing the environment for jogging, sailing, sky-diving, etc. Apart from that, one should not overlook the linkages between cultural ESS as part of the environmental context and personal and social conversion factors which exist in the CA model. For example, educational benefits derived from visiting a wild forest affect people's personal development, so that personal conversion factors might alter accordingly and thus play a new role in capability formation. Moreover, cultural ESS impact on social conversion factors e.g. by providing spaces for socialisation, affecting social cohesion, etc.

Having explored the possible roles of various ESS groups in capability formation, let us sketch a framework (following the one presented in **Figure 2**) which helps to account for the role of ecosystems as both producing goods and services for humans *and* affecting the

way people convert resources into capabilities (**Figure 3**). The social and personal contexts are only briefly sketched here as the focus is placed on the environmental context, particularly on ESS.

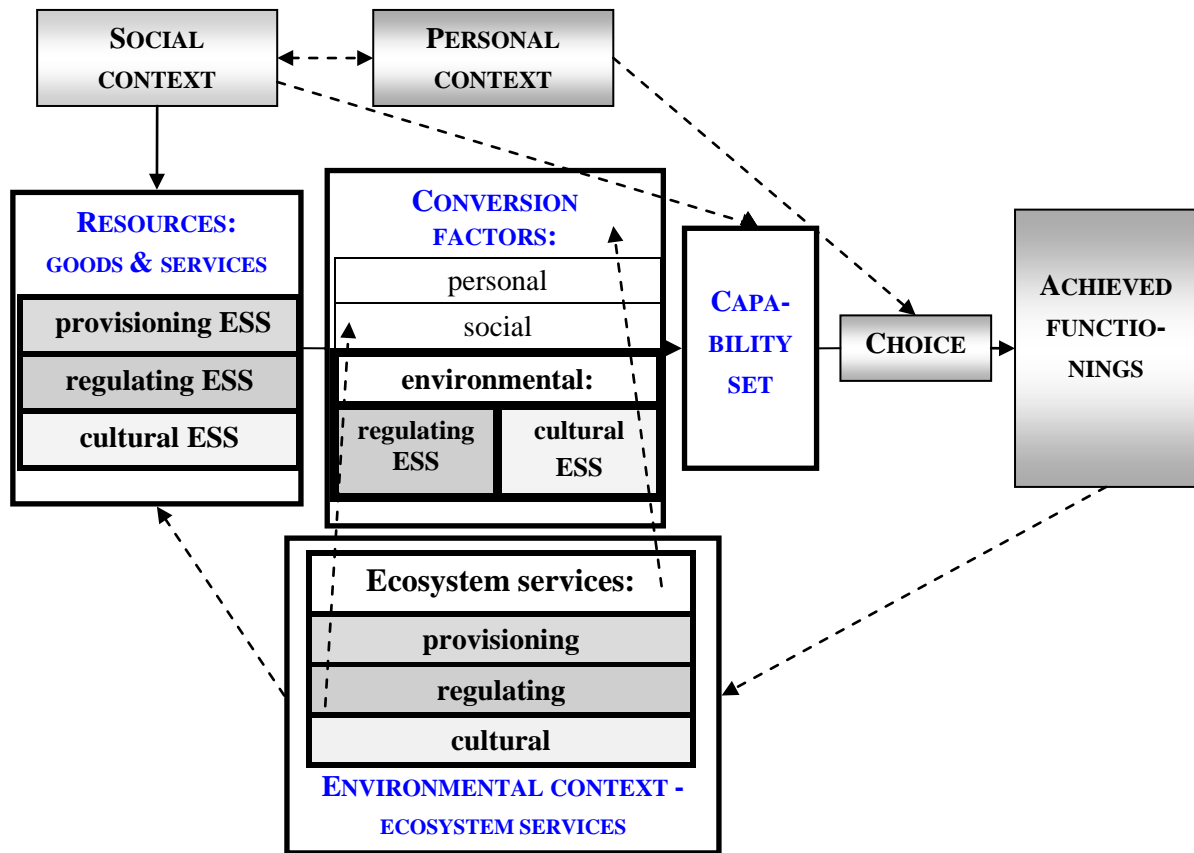


Figure 3: A representation of a person's capability set formation focused on the contribution of ESS

Figure 3 graphically demonstrates how ESS can be understood within the CA. In this graph, the dotted arrows refer to the impact of one factor on the another, whereas solid lines and arrows represent sequence.

It should be mentioned that, apart from ESS, the environmental context also covers the more “static” characteristics of the environment such as climate, topography, and tectonic characteristics. Moreover, we also consider natural resources as part of the environmental context. These embrace non-renewable resources such as oil, gas, and metals, as well as certain renewable resources not covered by the ESS concept, such as wind and solar energy. These two groups of factors play an important role in capability formation as well but are not represented in Figure 4 and will not be elaborated in this paper due to the explicit focus on ESS.

What can be learned from our conceptual incorporation of ESS into the capability

formation framework? Some advantages and insights of the CA perspective for understanding the ESS concept will be addressed at more length in Section 4. Before turning to it, let us first briefly examine how the capability approach itself benefits from the ESS concept. On a general level, the proposed model illuminates the role of the (natural) environment in capability formation, which highlights the necessity to explicitly include environmental factors in well-being assessments. In particular, the concept of regulating ESS assists in distinguishing between the various environmental conditions in a more detailed and systematised manner than currently done in the CA. Moreover, the ESS concept could potentially add dynamics to the static model put forward by Robeyns (2005) by showing how the environmental conditions worsen, improve, or are maintained, as well as by accounting for the influence of ESS on personal and social conversion factors. However, more work needs to be done in this direction; for example, the concept of ecosystem capacity (Holland, 2010) could perhaps provide useful insights in this regard.

Having specified the roles that ESS can play within the CA, let us move on to discuss how the understanding of the ESS concept can be enriched by using the CA as a theoretical lens.

4. Discussion: a new understanding of the ESS concept and implications for cultural ESS

Having shown the exercise of a theoretical “incorporation” of the ESS concept into the capabilities framework, we will now address some of the important implications stemming from it. Starting with the well-being dimension of the ESS concept, we proceed to some of the implications for cultural ESS, which have been only modestly analysed in the literature so far.

Going back to the emergence of the ESS concept, we notice that the “utilitarian framing of ecological functions as ecosystem services” (Gomez-Baggethun et al., 2010: 1215), which took place in the 1970–80s, shapes the way ESS has primarily become understood and conceptualised. Thus from the very beginning the utilitarian framework of ESS has moulded the perception of human-ecosystem relationships. Until now “a lack of explicit inclusion of the human dimension (e.g. people’s values and needs)” (Menzel and Teng, 2009: 907) has been characteristic of many studies and projects on ESS. Whereas the Millennium Ecosystem Assessment (MA, 2005) does address linkages between the groups of ESS and various well-being components, the relationship between the notions of “benefits” and “services” requires more scrutiny as these are not, in fact, substitutable categories.

If the lens of the capability approach is applied instead of a utilitarian framing, the relationships between ESS and human well-being become illuminated in a richer way compared to the direct linkages suggested in the MA (2005) (see **Figure 1**), as well as to the more recent TEEB vision (Kumar, 2010). First, provisioning, regulating, and cultural ESS, as has been suggested here, can indeed be seen as “goods and services” which contribute to human well-being (as can also be inferred from the MA representation). However, this relationship is not straightforward in reality: the relevant conversion factors have to be considered before the effects of these services on well-being can be identified. Second, cultural and regulating ESS can play the role of conversion factors in the CA model as they affect the way how the goods and services available to a person become “converted” into capabilities in a specific context. Third, ESS as part of the broad environmental context in the CA also impact on certain personal and social conversion factors, such as health, education, social relations, etc. Finally, and on a more general level, the CA highlights the multidimensionality of human well-being and offers a framework for linking it with the multidimensionality of the ESS concept. To summarize, accounting for the newly identified “roles” of ESS, the CA provides more insights for understanding and analysing the human dimension of the ESS concept and its implications for human well-being than, for instance, the utilitarian framework put forward by the Millennium Ecosystem Assessment and further elaborated by TEEB.

This new perspective might provide potential for a better understanding of cultural ESS in particular. While overall cultural ESS have received relatively little attention in the recent literature, the existing empirical contributions primarily focus on recreation and tourism as well as aesthetic information (e.g. USEA, 2008, Tyrväinen et al., 2007), leaving other types of cultural services almost unaddressed. Clearly, “it is quite artificial to separate these [cultural] services or their combined influence on human well-being” (MA, 2005: 457). For example, when a person swims in a lake, she can improve her physical (and perhaps mental) health, get rid of stress, relax and simultaneously enjoy the scenery, so that she benefits from several ESS at once. Still, at least six dimensions of key human-ecosystem relationships related to cultural ESS can be identified, namely cultural identity, heritage values, spiritual services, inspiration, aesthetic appreciation and finally, recreation and tourism (ibid.), and all of these categories require a careful examination and inclusion in well-being assessments. Only the last category can be relatively easily modelled by market-like situations, and – to some extent – captured by neoclassical valuation methods. The other categories, being more difficult to grasp, become often left out from the analysis.

In line with this remark, we base our analysis of cultural ESS through the CA on the (rather modest) existing literature. Having analysed a number of contributions, in the first

place by Nussbaum (2000), MA (2005) and Duraiappah (2004), we notice that the specific conceptualisation of well-being provides a foundation for establishing linkages between ESS and well-being. For example, one can establish a bigger number of linkages between cultural ESS and the various constituents of well-being if more of the “non-fundamental” aspects of well-being are included in the analysis. Thus, if we consider the ten central capabilities proposed by Martha Nussbaum (2000)⁷, cultural ESS can be linked to most of them (e.g. senses, imagination and thought, affiliation, other species, play, etc.). Comparing this observation with the United Nations Environment Programme (UNEP) Report by Duraiappah (2004), we can notice one interesting detail. While the Report is centred on ESS and human well-being and adopts the notion of capabilities, its orientation on poverty suggests that only one out of the ten major constituents of well-being is explicitly affected by cultural ESS.⁸ From such comparisons one can infer that depending on how well-being is conceptualised, different aspects of cultural ESS become relevant for the assessment.

Yet another aspect refers to the relationship between cultural ESS and the social context of one’s capability formation (based on our conceptualisation argued proposed in Section 3). For example, a significant aspect in the urban context is that urban ecosystems such as parks, forests, and lakes represent important meeting points for the local population, “thereby contributing to both cultural diversity and, paradoxically perhaps, social cohesion in the city” (Elmqvist et al., 2004: 309). These “socialisation points” play an important role in studying the actual capabilities that ecosystems enable. For example, if an urban park is largely “at the disposal of certain groups, namely those from the middle and upper classes” (USEA, 2008: 13), these “privileged” groups enjoy favourable recreational conditions, whereas the relevant capabilities of the lower social classes are restricted. This example stresses the necessity to consider the relevant conversion factors (in this case the social context) when addressing effects of ecosystems on human well-being.

We believe that the CA provides a fruitful framework for examining the ESS concept, transcending the notorious notion of benefits, often mono-dimensional, and illuminating the

⁷ According to Nussbaum (2000), the ten central capabilities refer to life, bodily health, bodily integrity, senses, imagination and thought, emotions, practical reason, affiliation, other species, play and control over one’s environment.

⁸ The ten elements of well-being according to Duraiappah (2004) are: 1) being able to be adequately nourished; 2) being able to be free from avoidable disease; 3) being able to live in an environmentally clean and safe shelter; 4) being able to have adequate and clean drinking water; 5) being able to have clean air; 6) being able to have energy to keep warm and to cook; 7) being able to use traditional medicine; 8) being able to continue using natural elements found in ecosystems for traditional cultural and spiritual practices; 9) being able to cope with extreme natural events including floods, tropical storms and landslides; 10) being able to make sustainable management decisions that respect natural resources and enable the achievement of a sustainable income stream.

diverse roles that ESS can play for human well-being. Within the CA framework, effects of ESS on well-being can be analysed in their relationship to the relevant personal and social conditions, so that the actual outcomes in terms of capabilities/functionings can be identified. The notions of *services* and *benefits* (the latter corresponding to “converted services”) become, thus, clearly distinguished. Moreover, such a framework allows studying effects of cultural ESS on human well-being in their diversity and with more scrutiny than done so far.

5. Conclusion

In this paper we have presented the argument that there is an alternative way of understanding the well-being dimension of the ESS concept than exclusively through the (utilitarian) lens of “benefits”. When well-being is conceptualised within the framework of the CA, ESS can be viewed as contributing in a number of ways to human well-being, i.e. enhancing freedoms to lead a life one has reason to value. With the exercise of conceptual incorporation and the examples provided above we have shown that ESS can be reflected in the capabilities framework both as goods and services *and* as environmental conversion factors, which “convert” available resources into capabilities. Moreover, ESS directly affect personal and social conversion factors. Such a view broadens the understanding of the human dimension of the ESS concept and thereby provides an alternative to the mainstream, mainly utilitarian framing. Thus, by introducing the CA perspective we hope to enrich the existing discourse on ESS and shed light on its less studied well-being aspects.

We also stress the need for more research specifically on cultural ESS and argue that it is important to make explicit the concrete conceptualisation of well-being when analysing effects of cultural ESS in their diversity, depending upon social and also upon human diversity. The CA appears a particularly promising framework for addressing these issues since it explicitly accounts for the diversity of people and individual circumstances. By placing the ESS concept into the CA framework of human well-being we have also demonstrated that the concept can be applied in contexts other than PES. For example, when introduced into the capabilities framework, the ESS concept can lead to improved evaluations of well-being through explicit inclusion of the environmental dimension in the assessments. Thus we see potential in the concept of ESS with regard to its role in addressing effects of ecosystems on human well-being – and more research from diverse perspectives is certainly required to make the proposed framework applicable in practice.

Acknowledgements:

We thank all commentators on the earlier versions of this paper, in particular Ortrud Lessmann.

References:

- Anand, P., Hunter, G., and Smith, R., 2005. Capabilities and wellbeing: evidence based on the Sen-Nussbaum approach to welfare. *Social Indicators Research* 74 (1), 9-55.
- Armsworth, P.R., Chan, K.M. A., Daily, G.C., Ehrlich, P.R., Kremen, C., Ricketts, T.H. and Sanjayan, M.A., 2007. Ecosystem-service science and the way forward for conservation. *Conservation Biology* 21(6):1383-1384.
- Ballet, J., Bazin, D., Dubois, J.-L., Mahieu, F.-R., 2011. A note on sustainability economics and the capability approach. *Ecological Economics* 70, 1831-1834.
- CBD – Convention on Biological Diversity, 1992. Convention on Biological Diversity. United Nations.
- Clark, D.A., 2008. The capability approach: its development, critiques and recent advances, in: Ghosh, R., Gupta, K.R., and Maiti, P. (Eds.), *Development studies, Band 2*. Nice Printing Press, Delhi, pp. 105-127.
- Comim, F., 2008. Measuring capabilities, in: Comim, F., Qizilbash, M., Alkire, S. (Eds.), *The capability approach: concepts, measures and application*. Cambridge UP, Cambridge, pp. 157-200.
- Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, H., Naeem, S., O'Neill, R., Paruelo, J., Raskin, R., Sutton, P. and van den Belt, M., 1997. The value of the world's ecosystem services and natural capital. *Nature* 387, 253-260.
- Daily, G.C., 1997. Introduction: What are ecosystem services? in: Daily, G.C. (Ed.), *Nature's services: societal dependence on natural ecosystems*. Island Press, Washington D.C., pp. 1-10.
- Daily, G.C., Polasky, S., Goldstein, J., Kareiva, P.M., Mooney, H.A., Pejchar, L., Ricketts, T.H., Salzman, J. and Shallenberger, R., 2009. Ecosystem services in decision-making: time to deliver. *Frontiers in Ecology and the Environment* 7 (1), 21-28.
- de Groot, R. S., Alkemade, R., Braat, L., Hein, L. and Willemsen, L., 2010. Challenges in integrating the concept of ecosystem services and values in landscape planning, management and decision making. *Ecological Complexity* 7, 260–272.
- Elmqvist, T., Colding, J., Barthel, S., Borgström, S., Duit, A., Lundberg, J., Andersson, E., Ahnér, K., Enrstson, H., Folke, C. and Bengtsson, J., 2004. The dynamics of social-ecological systems in urban landscapes: Stockholm and the National Urban Park, Sweden. *Urban Biosphere and Society: Partnership of Cities* 1023, 308-322.

Engel, S., Pagiola, S. and Wunder, S., 2008. Designing payments for environmental services in theory and practice: an overview of issues. *Ecological Economics* 65 (4), 663-674.

Farley, J. and Costanza, R., 2010. Payments for ecosystem services: from local to global. *Ecological Economics* 69, 2060-2068.

Gomez-Baggethun, E., de Groot, R., Lomas, P.L. and Montes, C., 2010. The history of ecosystem services in economic theory and practice: from early notions to markets and payment schemes. *Ecological Economics* 69, 1209-1218.

Grasso, M. and Giulio, E.D., 2003. Mapping sustainable development in a capability perspective. Dipartimento di Sociologia e Ricerca Sociale, Università degli Studi di Milano Bicocca and Eni Corporate University, San Donato Milanese.

Holland B., 2008. Ecology and the Limits of Justice: Establishing Capability Ceilings in Nussbaum's Capabilities Approach, *Journal of Human Development* 9:3, 401-425.

Holland, B., 2010. Defining environmentally sustainable human development: Should we value ecosystem capacity or services? Presentation at the HDCA Annual Meeting, September 2010, Amman, Jordan.

Jax, K., 2010. Ecosystem functioning. Cambridge: Cambridge UP, Cambridge.

Kumar, P. (Ed.), 2010. The Economics of Ecosystems and Biodiversity: ecological and economic foundations. Earthscan, London and Washington.

Lamarque, P., Quetier, F., and Lavorel, S., 2011. The diversity of the ecosystem services concept and its implications for their assessment and management. *Comptes Rendus Biologies*. doi: 10.1016/j.crv.2010.11.007.

Leßmann, O., 2011. Empirische Studien zum Capability Ansatz auf der Grundlage von Befragungen – ein Überblick. UFZ – Centre for Environmental Research, UFZ Discussion Papers, 4/2011-GeNECA 1, Leipzig.

MA – Millennium Ecosystem Assessment, 2005. Hassan, R., Scholes, R., and Ash, N. (Eds.). Ecosystems and human well-being: Current state and trends, Vol. 1. Island Press, Washington.

McCauley, D.J., 2006. Selling out on nature. *Nature* 443, 27-28.

Menzel, S. and Teng, J., 2009. Ecosystem services as a stakeholder-driven concept for conservation science. *Conservation Biology* 24 (3), 907-909.

Minteer, B.A. and Miller, T.R., 2011. The New Conservation Debate: ethical foundations, strategic trade-offs, and policy opportunities. *Biological Conservation* 144, 945-947.

Norgaard, R.B., 2010. Ecosystem services: From eye-opening metaphor to complexity

- blinder. *Ecological Economics* 69, 1219–1227.
- Nussbaum, M.C., 2000. *Women and human development: the capabilities approach*. Cambridge UP, Cambridge.
- Rauschmayer, F., Lessmann, O., 2011. Assets and drawbacks of the CA as a foundation for sustainability economics. *Ecological Economics* 70, 1835-1836.
- Robeyns, I., 2003. The capability approach: an interdisciplinary introduction. Training course preceding the Third International Conference on the Capability Approach, Pavia, Italy.
- Robeyns, I., 2005. The capability approach: a theoretical survey. *Journal of Human Development* 6 (1), 93-114.
- Sagoff, M., 2011. The quantification and valuation of ecosystem services. *Ecological Economics* 70, 497–502.
- Scholtes, F., 2010. Whose Sustainability? Environmental Domination and Sen's Capability Approach. *Oxford Development Studies* 38, 289-307.
- Sen, A., 1999. *Development as freedom*. Oxford UP, Oxford.
- Sen, A.K., 1987. *On ethics and economics*. Blackwell, Oxford.
- Sneddon, C., Howarth, R.B., and Norgaard, R.B., 2006. Sustainable development in a post-Brundtland world. *Ecological Economics* 57, 253-268.
- Spash, C. L., 2008. How much is that ecosystem in the window? The one with the bio-diverse trail. *Environmental Values* 17, 259–284.
- Tyrväinen, L., Mäkinen, K., and Schipperijn, J., 2007. Tools for mapping social values of urban greenlands and other green areas. *Landscape and Urban Planning* 79, 5-19.
- USEA, 2008. *Urban social-ecological atlas*.
[<http://www.stockholmresilience.su.se/download/18.87749a811cbd4c4fb4800030987/Manual+ver+3.pdf>] (Accessed online 02.11.2010).
- Wittmer, H. and Gundimeda, H., 2012. *The Economics of Ecosystems and Biodiversity in Local and Regional Policy and Management*. Earthscan.
- Wunder, S., Engel, S., and Pagiola, S., 2008. Taking stock: a comparative analysis of payments for environmental services programs in developed and developing countries. *Ecological Economics* 65, 834-852.