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general versus specific, and conceptual versus practical

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Sustainability economics – general versus specific, and conceptual versus practical

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Abstract. We clarify the definition and interpretation of "sustainability economics" (Baumgärtner and Quaas 2010) in response to recent comments by van den Bergh (2010), Bartelmus (2010) and others. For that sake, we distinguish between general and specific definitions of sustainability and sustainability economics, as well as between conceptual and practical approaches.

Keywords: economic and environmental accounting, efficiency, externality, joint production, justice, stocks, sustainability economics

JEL-Classification: Q0, D63, B0

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1. Introduction

"Sustainability" is a multi-faceted and contested notion, with different people holding different definitions and interpretations of it (Dobson 1996). The same goes for "economics" (Hausman 2007). No wonder then that any attempt at defining "sustainability economics", as we have done it (Baumgärtner and Quaas 2010, "B&Q"), can be disputed. We welcome an open, constructive and pluralistic discussion of "What is sustainability economics?" as, indeed, much about the notion of "sustainability economics" as well as the research field denoted that way still has to be clarified. Therefore, we are happy to discuss and clarify some of the issues that have been raised by van den Bergh (2010, "vdB"), Bartelmus (2010) and others[1].

Much of the critique of our proposed definition of "sustainability economics" (Baumgärtner and Quaas 2010) seems to root in that we have not given one or the other *specific* definition of sustainability economics, but rather a *general* definition that encompasses and structures quite a lot of different specific understandings of sustainability economics, including those held by the pioneers of the field (e.g. Boulding 1966, Ayres and Knees 1969, Georgescu-Roegen 1971, Daly 1968, 1973, 1977, Costanza 1991, among others) and some prominent current proponents of sustainability economics (e.g. Ayres et al. 2001, Söderbaum 2007, 2008, Ayres 2008; for surveys see Pezzey and Toman 2002, van den Bergh 2007). In Section 2, we are going to show how our general definition of sustainability economics relates to more specific definitions that are based on notions of weak or strong sustainability.

What's the use of defining sustainability economics in a general manner? We feel that the literature that has been accumulated in that field is quite heterogeneous and to a large extent unrelated, the field gets definitely fuzzy at the edges, and it lacks structure that could serve as a solid basis for further and systematic advances. In this situation, it helps to take a fresh look at what seemed to be familiar for too long already, and to identify unifying characteristics, intellectual structure, and perspectives. It is in this spirit that we have suggested a general and concise definition of sustainability economics. It re-establishes focus on the original, and still relevant, motivation to study and manage sustainability from an economic perspective. This new and encompassing perspective on the field also generates new core questions and insights beyond the ones already asked. For example, one very important class of questions that newly comes into the focus of sustainability economics is that of potential trade-offs and conflicts between the different normative goals of sustainability (sensu equity) and (economic) efficiency.

As we have put forward a general definition of sustainability economics which starts from the overall normative goals that a society should pursue, one critique is that such an approach is not as useful as starting on practical grounds, in particular from national economic and environmental accounting (Bartelmus 2010). In Section 3, we are going to argue that such a practical approach is not an alternative to, but rather presupposes and requires, a general and normatively founded definition of sustainability economics.

In Section 4, we deal in detail with the core argument of van den Bergh (2010), namely the role of externalities for sustainability economics. We briefly review the extensive literature that provides various definitions of "externality", some being purely descriptive, some including a substantial normative content. We propose to use the purely descriptive and more

[1] Some have approached us directly and informally with their reactions to our article, e.g. Peter Söderbaum (Mälardalen University) and Udo E. Simonis (Social Science Research Center Berlin).

general concepts of *joint production* and *stocks*, rather than externalities, to complement the normative concepts of justice and efficiency that we use to define sustainability economics.

2. Sustainability economics – general versus specific

In defining sustainability economics in a general manner (B&Q), we have started from the normative foundations of both "sustainability" and "economics". Briefly put,

1. sustainability aims at *justice* in the domain of human-nature relationships and in view of the long-term and inherently uncertain future, including (i) justice between humans of different generations ("intergenerational" justice), (ii) justice between different humans of the same generation, in particular the present generation ("intragenerational" justice), and (iii) justice between humans and nature;
2. economics is aimed at an ever better *satisfaction of human needs and wants*, with a focus on *efficiency*, that is non-wastefulness, in the use of scarce resources to achieve this goal.

So, sustainability economics is defined as aiming towards both justice and efficiency with respect to human-nature relationships over the long-term and inherently uncertain future. Thus, our understanding of sustainability as an issue of justice (or: equity), which is separate from the genuinely economic issue of efficiency, is in line with important contributions from both neoclassical and ecological economics (e.g. Solow 1974, Dasgupta and Heal 1979, Howarth and Norgaard 1990, Pearce and Duborg 1996, Woodward and Bishop 1995, Pezzey 1997).[2]

This is a general definition of sustainability economics, as we refer to the ideas of "justice" and "efficiency" in general. Both of these ideas need to be specified to obtain specific notions of sustainability and sustainability economics. If, for example, one specifies "justice" as purely anthropocentric and utilitarian in the sense of "non-declining utility over time", and if natural goods and services can to a sufficient degree be substituted by human-made goods and services, then one arrives at what has been called "weak sustainability". If, in contrast, one understands "justice" as going beyond purely anthropocentric concerns and including intrinsic rights of nature, or, alternatively, if one understands "justice" as anthropocentric and utilitarian but natural goods and services cannot to a sufficient degree be substituted by human-made goods and services, then one arrives at what has been called "strong sustainability".[3] Both of these notions are specific notions of sustainability that emerge from specific ideas of justice and specific assumptions about human-nature interactions, and, hence, are special cases of our more general definition.

3. Sustainability economics – conceptual versus practical

Bartelmus (2010) suggests that environmentally modified national economic accounts or indicators offer a practical conception of sustainability that can do without, and is therefore superior to, basing a sustainability concept on "non-measurable welfare or happiness". The

[2] Others, in contrast, understand sustainability right away as encompassing both intergenerational justice *and* dynamic efficiency (e.g. Stavins et al. 2003). Daly (1992) also distinguishes between the normative goals of allocative efficiency and distributive justice, but understands "sustainable scale" as yet another and independent normative goal.

[3] Still other vindications of weak and strong sustainability exist (e.g. Neumeyer 2003).

latter is what he criticizes B&Q and vdB for. In support of this suggestion, Bartelmus claims that "[a] great deal of nature's assets and asset services can be costed in integrated environmental and economic accounts … without resorting to utility and welfare estimates", by using monetary valuation.

However, theory shows that any monetary valuation essentially relies on the distribution of incomes and wealth, both within our current generation as well as between generations (e.g. Weitzman 1976, Mas-Colell et al. 1995: Chap. 17, Freeman 2003: Chaps 2, 3). The reason is that the whole price system, including the interest rates, used for monetary valuation and aggregation in national accounts depends on the distribution of incomes and wealth.[4] This is true both for actual market prices or people's willingness to pay for non-market goods and services, as well as for shadow prices[5] that indicate the "true" economic scarcities, that is, the scarcities of resources with respect to the overall societal goal that is being pursued. "Greening the accounts" or developing sustainability indicators that rely on aggregation in value terms therefore presupposes and requires knowledge of the overall societal goal, in particular the distribution of incomes and wealth that is considered to be just. It cannot replace such a normative conception of sustainability.

The current practice of national (and sustainability) accounting of taking current market prices, which are distorted in many ways and which derive from the status-quo distribution of incomes and wealth, to value environmental services and components of natural capital conceptually thus essentially presupposes that the status-quo distribution of incomes and wealth is already close to society's objectives, i.e. it can be considered equitable within and across generations.[6] As this cannot be taken for granted, the current green-accounting practice falls short of what it aims to achieve – namely to produce meaningful indicators of sustainable economic development..

Putting more effort into the development of meaningful sustainability accounting and indicators is nevertheless fruitful and may indeed constitute practical progress towards measuring and indicating sustainable economic development. However, it presupposes and requires a conceptual clarification of what constitutes, in terms of individual well-being, the overall societal goal of sustainable economic development. It is this latter point that, therefore, deserves to be at the center of attention in any attempt to define sustainability economics.

4. Externalities, joint production, stocks, and sustainability

At the core of van den Bergh's (2010) discussion is the role of externalities for sustainability. Indeed, vdB simply seems to identify sustainability with absence of, or perfect internalization of, externalities: "[u]nsustainability means that the future is affected by current decisions, so that there are unavoidably dynamic or intertemporal externalities involved. In fact, without such externalities the problem of unsustainability vanishes."

In order to clarify this point, we should first of all distinguish between normative and descriptive concepts: normative concepts specify an idea of how the world *ought* to be; descriptive concepts specify how the world actually *is* or could be. Allocative efficiency,

[4] This basic argument may be illustrated using a simple Edgeworth-box.

[5] Shadow prices can be obtained, for ecxample, from linear programming based on ecological-economic input-output models – an approach suggested by Bartelmus (2010).

[6] If it is not, even a comprehensive measure of national accounts may be a misleading indicator of sustainability (Asheim 1994).

distributive justice, and sustainability (both in our as well as in vdB's understanding of the term) are all normative concepts. Externality, in contrast, is mostly used as a descriptive concept, describing a particular cause-effect-relationship.

Furthermore, in order to assess the potential impacts of present human actions on other humans or non-human nature, both present or future, we should also clearly distinguish between the different normative goals that a society may pursue. In particular, in our notion of sustainability economics we distinguish between the two goals of allocative efficiency (in the sense of overall non-wastefulness of scarce resources) and justice (in the sense of a morally right order of people and things within a community of justice). As already stated above (Section 2), both of these goals need further specification to be operational, but even at this general level (and even more so in specific concretizations) they can be clearly distinguished.

In our definition of sustainability economics, we have been explicit on the normative side (see Section 2 above), defining sustainability economics as aiming towards both encompassing justice and efficiency. We have not been very explicit in terms of description of human-nature relationships over time and under uncertainty, though, as this is not decisive for a definition of "sustainability economics" that starts from its normative goals. Of course, the question asked by vdB, what is the role of today's actions for the achievement of sustainability, is a very important research question of sustainability economics. Yet, we believe that the externality concept may not the best suited concept for addressing this question.

The concept of externality has a long and rich history in economics, starting with ideas of Alfred Marshall (1890) on the distinction between internal and external economies of scale in the production of goods by individual firms, later transferred to individual well-being and included into welfare economics by Pigou (1912/1920), and still later sharpened and formalized in different ways, also for the environmental and resource context, by Viner (1931) , Meade (1952, 1973), Scitovsky (1954), Buchanan and Stubblebine (1962), Arrow (1970), Mishan (1971), Baumol and Oates (1975) and Heller and Starrett (1976), to cite just a few. Today, there exist very different conceptions of externality – some very wide, including all actions of economic agents that have an appreciable impact (benefit or damage) on another economic agent's utility or production possibilities without their full consent; and some rather narrow, denoting only the *direct* impacts of that kind.[7] In another dimension, which is based on the consequences rather than on the origins of externalities, one can distinguish between conceptions of externalities that include only Pareto (i.e. efficiency)-relevant impacts, and others that also include distributive impacts. Either way, since Pigou the concept of externality has often (implicitly) been loaded with more or less normative connotations.[8]

Obviously, any answer to the question of what is the role of (dynamic) externalities, or their internalization, for achieving the normative goals of allocative efficiency and distributive justice crucially depends on exactly what conception of "externality" one subscribes to. But irrespective of any terminological variety in, and therefore potential confusion about, the concept of externality, it is clear that today's actions influence the state of nature and the economic conditions of persons living in the future, and thereby have a potential impact in terms of these two normative goals.

A rather straightforward, yet more general and fruitful, way of describing this impact using purely descriptive concepts, which we therefore consider to be superior to a description in

[7] Defining "externalities" with reference to direct impacts rules out something like "intertemporal externalities" altogether, as future impacts of present actions are never direct.

[8] Cornes and Sandler (1996: 39), who survey and discuss the different conceptions of externality, observe that "[t]here is a strong temptation to avoid giving an explicit definition of *externality*, since even this first step has been a fertile source of controversy".

terms of the concept "externality", is the combination of the concepts of *joint production* and *stocks* (Baumgärtner 2000, Faber et al. 2005, Baumgärtner et al. 2006). In a nutshell, *joint production* means that along with the intended outcome of some action, e.g. the production of a product such as electricity from fossil fuels, there are necessarily other effects which one may be aware of or not, e.g. material by-products such as the release of carbon dioxide into the atmosphere or immaterial changes such as a change in knowledge, habits, or institutions. Indeed, externalities have already long ago been described as a special case of joint production (Buchanan 1966, Mishan 1969). A *stock*, briefly put, is an entity that has, in principle, temporal durability and variability according to some dynamic relationship. If some present action somehow modifies a stock, e.g. present emissions of carbon dioxide contribute to the stock of that substance in the atmosphere, and this stock, in turn, is of relevance for future decisions, e.g. on how to manage agriculture under the prevailing climate conditions, then the stock dynamics allows an understanding of how present actions become relevant for future potential and actual decisions.

Any discussion of sustainability has to deal with the concept of stocks, as stocks are the entities that link current actions to future outcomes. The concept of joint production adds another dimension, a central question being whether the (present and future) effects of joint products are taken into account in current decisions or not. If they are not, joint production may constitute an externality (in a more narrow sense) and may give rise to allocative inefficiencies, both in a static and in a dynamic setting. However, allocative efficiency and distributional justice are objectives that are (at least analytically) distinct. Internalizing externalities (in the common understanding of both "externality" and "internalization") achieves allocative efficiency, but not necessarily distributive justice and thus not necessarily sustainability (Howarth and Norgaard 1990, Woodward and Bishop 1995).[9]

5. Conclusion

Summing up in one sentence, we believe that defining "sustainability economics" in a general (rather than a specific) manner, starting from the normative foundations of both sustainability and economics (rather than from practical approaches to economic sustainability), based on a clear distinction between the different normative goals involved, in particular efficiency and justice, and complementing such a normatively rooted definition by the purely descriptive concepts of *joint production* and *stocks* (rather than *externalities*) for a description of how present actions link to present and future impacts on nature and people, is useful for organizing and advancing our thinking on sustainability economics in a focused, systematic and methodologically sound manner.

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[9] In some instances, the efficient internalization of an intertemporal externality may at the same time reduce an intergenerational injustice. However, it is also imaginable that the efficient internalization of an intertemporal externality may cause or increase an intergenerational injustice.

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