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THE ROLE OF VALUES IN SUSTAINABILITY EVALUATION: INSIGHTS FROM THREE DUTCH APPROACHES

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Summary. *This paper reviews three recent approaches to sustainability evaluation by Dutch scientists. Conclusions are drawn with respect to the possibility and desirability of excluding normative and subjective elements from the evaluation of sustainability. Suggestions are given on how such elements can best be handled by sustainability scientists supporting policy makers.*

1 INTRODUCTION

About 25 years ago, the concept of 'sustainable development' was introduced and defined for the first time in an international context in the World Conservation Strategy[1]: "For development to be sustainable, it must take account of social and ecological factors, as well as economic ones; of the living and non-living resource base; and of the long-term as well as the short-term advantages and disadvantages of alternative action." The most widely cited definition, however, comes from the Brundtland-report[2]: "Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs." Many other definitions have been proposed since, but together these two early definitions express the essence of sustainable development, i.e. development that fulfils the needs of all people, here and elsewhere, now and in the future, in the economic, ecological, as well as the socio-cultural domain. The major ambition underlying the concept is to achieve balanced development and to prevent negative external effects of improvements in one domain or for one group of people to other domains or groups.

Due to its multi-dimensional approach, sustainable development is an extremely complex challenge, requiring the input from many different disciplines, from scientific as well as practical knowledge. At the same time, there is considerable uncertainty and diversity in scientific knowledge on sustainability problems because of their complexity. However, sustainable development is not only a complex concept, it can also be characterized as normative, subjective and ambiguous[3]. The normative principle in the concept is that of inter- and intra-generational equity. Although this principle as such is broadly agreed upon, its interpretation varies, and consensus is often lacking when more specific standards are derived from this general principle. The concept is also of a subjective nature, as in particular the interpretation of human needs depends on personal views or preferences. People are bound to differ in opinion as to what important needs are and when these needs are sufficiently fulfilled. As a consequence they will also differ in their choice of indicators and targets for sustainable development. Finally, the concept of sustainable development is also ambiguous, as it does not contain a clear statement on the relative priority or weight of the ecological, economical and socio-cultural aspects of development. This makes it rather difficult to determine whether developments are sufficiently balanced to be called sustainable.

These four characteristics, complexity, normativity, subjectivity and ambiguity, make operationalization of the concept of sustainable development in policies at all levels a value-laden affair. Depending on one's value system and world view, different attitudes are displayed towards the risks associated with the uncertainty that surrounds complex sustainability problems. Different standards will be advocated on the basis of the core values of intra- and intergenerational equity. Different aspects of development will be preferred, and different weights will be attached to the various pros and cons of a development. As a consequence, in the evaluation of the sustainability of development pathways, values play an equally dominant role. Value judgments pertain to all crucial elements of the evaluation procedure: the formulation of the goals of sustainable development, the selection of indicators and establishment of concrete targets, and the construction of a mechanism to weigh qualitatively different aspects of sustainability. This raises questions about the role science can play in the evaluation of sustainability, as scientists often claim and strive for objective, rational, and fact-based judgments.

In this paper, three recent approaches to sustainability evaluation by Dutch scientists are reviewed and lessons are drawn with respect to the possibility and desirability of excluding normative and subjective elements from the evaluation of sustainability. We conclude with suggestions on how such elements can best be handled by sustainability scientists supporting policy makers.

2 THREE RECENT EXAMPLES FROM THE NETHERLANDS

In recent years, three distinct 'evaluation tools' were developed by Dutch scientists to support policy makers in ex post and ex ante evaluation of sustainability. Their approaches differ strongly in the way value judgments are handled in the construction of the evaluation tool. The 'Sustainable National Income', an overall index developed upon request by the national parliament, represents an attempt to ban subjective normative values and to arrive at an objective index[4, 5]. The 'Sustainability Balance' is a multi-indicator monitor developed for regional and local policy makers and the outcome of a participatory inter-subjective consensus approach[6]. Finally, in the development of the 'Sustainability Index' for the national strategy for sustainable development, an explicitly pluralistic approach was followed, resulting in different indices based upon different epistemologies or 'world views'[7].

In this section, the three examples of sustainability evaluation will be briefly described in terms of their context, definition of sustainability, choice of indicators and targets, and the differential weights attached to the various aspects of sustainability. The section concludes with a comparison of how value-laden aspects of evaluation were dealt with in the examples.

2.1 Sustainable National Income

The Sustainable National Income (SNI) is a concept proposed by the environmental economist Roefie Hueting. The Dutch parliament commissioned an independent research group to operationalize Hueting's concept[8], because the politicians felt the need for a welfare indicator that was broader than the commonly used Gross National Product (GNP) or Net National Income (NNI). SNI is intended as a tool to evaluate the sustainability of the nation's welfare, and, when calculated over a period of several years, to assess whether the nation developed into a more sustainable direction.

In this approach, sustainability is defined as the use of vital environmental functions in such a way that these remain indefinitely available[4]. Environmental functions are possible uses of our biophysical surroundings, such as provision of fresh water, clean air and natural resources. Sustainability involves preserving the regenerative capacity of renewable resources, compensating the use of non-renewable resources by substitutes and prevention of pollution-associated risks for future generations. The goal of conservation of vital functions is founded upon the normative principle of intergenerational equity, but, according to Hueting and Reijnders[4], these vital functions can be identified and defined in an objective, purely scientific way. The same applies to the selection of indicators for these functions and the establishment of the associated target values that indicate sustainable use, the so-called 'sustainability standards'.

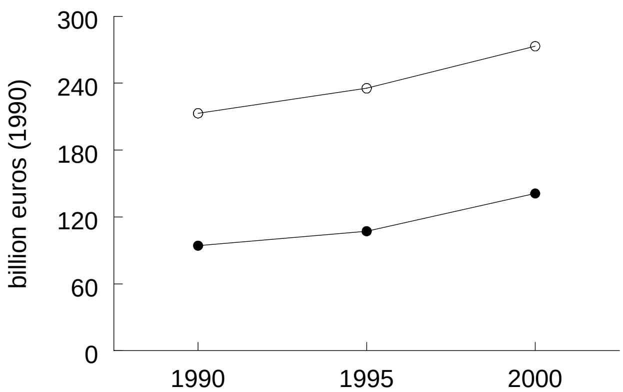

Figure 1: Trend in Sustainable National Income (●) and Net National Income (o) for the Netherlands, 1990-2000 [9]

Hofkes and colleagues[9] calculated the SNI for the Netherlands, using an economic model and historical data of the Dutch economy (Figure 1). In this calculation, the conventional NNI of a given year is corrected for 'unsustainability' by subtracting the costs of technological measures to reach the sustainability standards, and, when available technology is not sufficient, by reducing the volume of production and consumption of certain goods. The calculation is based on the assumption of an absolute preference for the conservation of vital environmental functions. Welfare in economic terms is adjusted to meet this objective. There are no independent economic goals, nor are social aspects of sustainability considered. SNI indicates the 'sacrifice' in consumption levels and patterns required to achieve sustainable welfare. It is up to the political process to weigh and decide whether society is willing to pay this price for ecological sustainability. This decision-making process is outside the realm of objective natural science.

2.2 Sustainability Balance

The Sustainability Balance (SB) was developed by Telos, a scientific center for sustainable development, at the request of the government of the Dutch province of Brabant. The SB is intended as a tool to evaluate and monitor sustainable development at a regional level[6]. The development of the SB was shaped as a participatory process, involving policy makers and other stakeholders.

The SB is founded upon the three pillars approach to sustainability, giving equal weight to the ecological, economic and socio-cultural aspects. These aspects are viewed as three forms of 'capital', and sustainable development is defined accordingly as harmonious and balanced growth of these three forms of capital. In this tri-capital model, each capital is conceived as made up of various stocks. Examples of stocks are infrastructure, biodiversity and education. The condition of these stocks is characterized by a set of indicators. To evaluate whether stocks develop into the desired direction, the general normative principles of economic efficiency, social justice and ecological resilience, are translated into stock-specific normative requirements and target values for the indicators. The current condition of a stock is expressed in percentage values of the various indicators, relative to their targets. In a stepwise weighing-and-combining procedure, the current condition of the three forms of capital is determined, relative to the desired situation of sustainability (Figure 2). In the SB, deliberately no overall, integrated index of sustainability is calculated, as the purpose is not only to show 'distance to target', but, more importantly, to indicate how balanced the current state of development is.

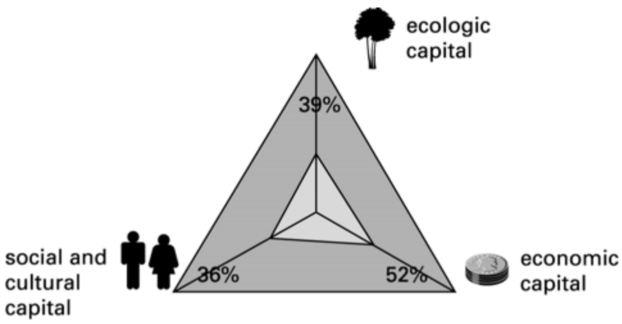

Figure 2: The Sustainability Balance for the city of Eindhoven in 2003 [15]

2.3 Sustainability Index

The Sustainability Index (SI) was constructed by the Netherlands Environmental Assessment Agency (NEAA) as part of their 'Sustainability Outlook'[7], which was conducted at the request of the Dutch government, to support the development of a national strategy on sustainable development. The government specifically asked for a set of transparent and traceable indicators to monitor sustainability at the national level.

In NEAA's approach, sustainability was broadly defined as the possibility to continue the currently preferred quality of life, in which 'quality of life' is the extent to which ultimate human goals, such as good health and personal development, are being achieved. The three domains of sustainability are viewed as a pyramid of means and goals, in which the (ultimate) ecological means form the supporting physical base, the (intermediate) economical means and goals the middle part, and the (ultimate) socio-culturally defined goals the top. Depending on their value-orientation, people prefer different goals and have different ideas about the desirability and efficiency of alternative economic systems. These different perspectives on the goals of sustainable development and the means to achieve it are called 'world views'.

In a pluriform, democratic society multiple 'world views' co-exist, which are internally consistent but externally conflicting. NEAA therefore took a pluralistic approach, and constructed different indices of sustainability, based on different world views. First, they identified on the basis of public polls four qualitatively distinct world views. For each world view a set of sustainability indicators was selected, partly based on a world view's value-orientation (for the socio-cultural and economic domain) and partly based on scientific insights (for the ecological and economic domain). By means of a public poll differential weights were attached to each indicator. Subsequently, the indicators were combined into an integrated index of sustainability (SI), one for each of the four worldviews. The four SI's were calculated for the Netherlands over a period of 30 years, to evaluate the sustainability of the current situation and past trends (Figure 3). The values of the indicators comprising the SI were taken relative to their most favorable value during this 30-year period. Combining ecological, socio-cultural and economic indicators into a single index implies the view that there is no absolute preference for any of the domains. Progress in either domain is thus considered interchangeable.

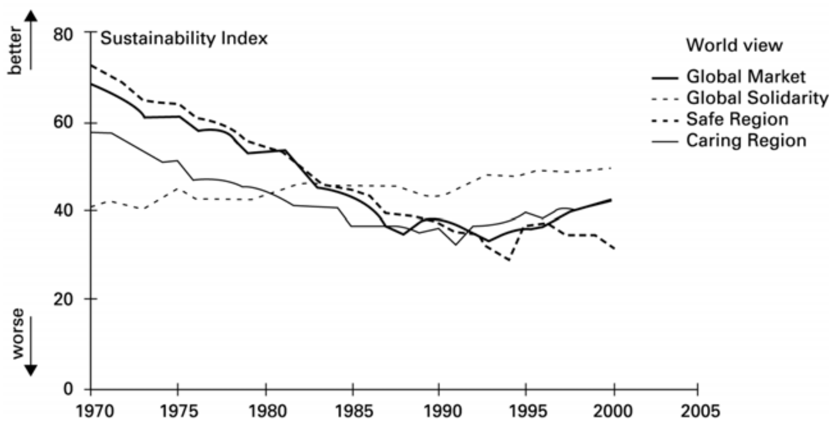

Figure 3: Sustainability Indices for the four world views [7]

2.4 The role of values

The three approaches described above obviously differ strongly in the way value judgments are handled in the evaluation procedure. Hueting and Reijnders stand out with their claim that the sustainability standards on which the calculation of the Sustainable National Income (SNI) is based, are objective 'to the extent that natural science is objective'[4, 10]. They make a sharp distinction between normative goals of sustainability and political choice on the one hand, and objective scientific evaluation on the other hand.

The developers of the Sustainability Balance (SB) acknowledge that the process of translating widely accepted normative principles into context-specific requirements, indicators, weights and targets, involves many normative and subjective choices. This applies in particular to the socio-cultural and economic aspects of sustainability, but also in the ecological domain many arbitrary decisions are made. Therefore they conduct the whole evaluation procedure in close cooperation with policy makers, and also involve other stakeholders in the formulation of context-specific sustainability requirements.

In the development of the Sustainability Index (SI) no inherent normative principles or goals of sustainability are assumed, but these are accepted to differ between different world views in a pluriform democracy. In this pluralistic approach, also the selection and weighing of indicators is recognized to be largely governed by world view-dependent normative and subjective choices. The values and preferences underlying the world view-specific indices of sustainability were determined through public polls. The procedure results in four different, subjective perspectives on sustainability.

3 DISCUSSION AND CONCLUSIONS

The three examples raise a number of fundamental questions with regards to the role of value judgments, i.e. normative and subjective choices, in sustainability evaluation. Can normative and subjective elements be excluded, as Hueting and Reijnders claim[4]? If not, how can scientists best deal with these elements in sustainability evaluation?

Whereas the developers of the Sustainability Balance (SB) and Sustainability Index (SI) acknowledge that evaluation of sustainability is essentially a normative and subjective procedure, Hueting and Reijnders argue for the contrary in the case of the Sustainable National Income (SNI)[4, 10]. However, their attempt to make evaluation a matter of objective science is founded upon a series of normative and subjective choices. These include not only their choice for intergenerational equity as the normative point of reference, but also narrowing down sustainability to its ecological aspects (narrow versus broad sustainability), and their absolute priority for environmental interests over economic and social interests (strong versus weak sustainability). Furthermore, their position that environmental risks cannot be accepted to any extent is a subjective, normative choice, resulting in a preference for conservative standards in case of scientific uncertainty and widespread application of the precautionary principle. There is, however, no objective, scientific reason against a less risk-averse attitude and accepting a bit more risk in exchange for lower economic or social costs.

Our conclusion therefore must be that value-based normative and subjective choices cannot be excluded from an evaluation of sustainability. This poses a dilemma to scientists, who are usually involved in the evaluation procedure on the grounds of their objective and interest-free position and contribution. In case of both SB and SI a similar way out of this dilemma is chosen. Normative and subjective choices are made explicit as much as possible, so that they can be identified and criticized by others and modified if needed. These choices are not made by scientists, at least, not alone, but by multiple relevant societal actors, either through direct participation in the process (SB) or through public polls (SI).

The lesson to be drawn from these three examples can also be formulated in more general terms with regards to the role of scientists in sustainable development. Clearly, the issue of sustainability as a whole cannot be objectified and thus not solved by science in the way mathematicians solve problems. In the end, there are hard choices to be made, and as these choices are value-laden, they should be made in the political process. So how can scientists support this process? Hueting and Reijnders' position as 'scientists speaking truth to power'[11] ignores that their 'truth' is not objective and that science is not univocal. When the problem of sustainability is not 'scientifically solvable' it should be made 'politically decidable'. According to the Netherlands Scientific Council for Government Policy this requires that conflicting goals, alternatives, trade-offs and dilemmas must be made explicit and transparent[12]. Otherwise, the process of political decision making and policy making, in which advantages and disadvantages are weighed and priorities are assigned, cannot function properly. The role of scientists in the evaluation process is thus primarily to provide a structured, integrated approach for policy makers and to ensure a transparent process for all citizens, in which subjective choices and (scientific) knowledge sources are made explicit and relevant scientific information is selected and included in the process. In case the scale of the evaluation and the diversity of perspectives preclude a consensus approach, ex post and ex ante evaluations should be conducted from multiple perspectives. International examples of this approach can be found in the approach of the Intergovernmental Panel on Climate Change[13] (IPCC) and the recently completed Millennium Ecosystem Assessment[14].

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