Food sustainability
Diverging interpretations

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Abstract The concept of sustainability in general and food sustainability, in particular, entails many aspects and many interpretations. During a conference on food sustainability a broad, multidisciplinary picture was painted and many key issues were dealt with, from ecology, economy and society. In sessions on food security – the focus in developing countries – and food safety – primarily a preoccupation in developed countries – many potential trade-offs and opportunities for regional approaches were identified. The session on governance, therefore, focused on the interaction between multi-level actors, including national governments, international organisations such as WTO, the food industry and consumers. Finally, transparency was identified as one of the main issues underlying good governance. In order to improve the sustainability of food production, therefore, it was considered of the utmost importance that food multinationals transfer some form of democratic control over their global environmental policies, as part of an overall multi-level (public-private) governance ideal.

Introduction
On 6 February 2003, the 6 Lustrum Conference of the Institute for Environmental Studies (Vrije Universiteit, Amsterdam) was devoted to food sustainability. The relationship between food and sustainability dates back to the 1980s, when sustainable development became an overarching policy objective for all nations. After 20 years of debate on how to manage the earth’s resources, it was a milestone that the World Commission on Environment and Development (WCED) was able to establish clear linkages between global environmental deterioration, poverty, and rapid population growth (Brundtland, 1987). In view of this extremely negative prospect, the WCED stated that “Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs”.

The statement by the WCED is often used as a definition of sustainable development. It links the environment’s ability to meet present and future human needs with theories of social justice – both within and between generations – as a basis for ecological, economic and social aspects of sustainability (Largelle, 2000). This is a very attractive combination for people who are concerned about the world’s future, because they can use it as an ethical principle and as an economic concept. Given its high level of abstraction and generality, however, the concept should be used

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with caution. At the level of international policymaking there were already reservations in the early 1990s, as a result of emerging discrepancies between the “environmental” agenda of developed countries and the “development” agenda of many poor countries (Yearley, 1994).

An important reason for caution is also that sustainable development refers to long-term balances between ecological, economic and social processes at the level of society as a whole. Accordingly, it is often not possible to specify fully what this concept ideally means at the level of a particular development project or production process (Pezzey, 1992). With a view to long-term impacts, for example, it may be uncertain whether it is more sustainable to replace a certain product completely than to improve its production process. Regarding the use of natural resources, such as fishery and forestry, there are many questions about regionally differentiated ways of sustainable management.

Despite these difficulties, there are still many attempts to improve the substantiation of sustainability claims at the level of projects and products. Instead of claiming very general differences in sustainability, it appears more feasible and attractive to work up from a low level of abstraction with relatively concrete topics, identifying significant “ills” one would like to avoid (e.g. dependence on pesticide use) or specific “ideals” one would like to attain (e.g. recycling). As the political scientist Lindblom (1990) notes, it is often easier for a heterogeneous society to agree on the ills to be avoided (e.g. poverty) than on the ideals to be achieved (e.g. the ideal income distribution). However, the pursuit of sustainability may require a mixture of both.

**Food sustainability**

The issues mentioned above apply even more to food production and consumption than to other human activities, because food provision is in fact the human activity with the single largest environmental impact (Smil, 2000). A major proportion of surface water and a large proportion of energy is appropriated by food supply and these imbalanced ratios will require a stepwise – rather than an incremental – improvement (Vellinga and Herb, 1999). Sustainability should not be understood as a requirement to maintain a static situation, but as a challenge to preserve the resilience and adaptability of the natural systems that form the basis of social and economic development. Relieving the environmental pressure of food production for a growing world population – which might approach nine billion by 2050 – is in different ways a challenge for all nations (Tilman et al., 2002). In developing countries, food security is still the main issue, and it may take precedence over environmental impacts. In developed countries, this has shifted due to increased affluence, so there, food safety is considered a main issue, which may take precedence over environmental impacts. North and South are meeting at the political negotiation table, be it on international trade rules, biodiversity, poverty, loans, pesticides, GM food, property rights, fishing or water rights.

Depending on the system boundaries, various methods are called for to assess the sustainability of food options as these are linked with different types of environmental pressure. Life cycle analysis (LCA) is one of the possibilities. In addition, much depends on the technological feasibility and the societal acceptability of potential solutions, such as a partial diet shift from animal protein to plant protein (Aiking and Vellinga, 2000). However, there may be serious gaps between producers’ and consumers’...
understanding of sustainability. Several large companies, such as DuPont and Monsanto, describe sustainability in terms of “ecologically sound, economically viable and socially acceptable” (Kloppenburg et al., 2000; WBCSD, 2003). In contrast, consumers may use “sustainability” as a kind of shorthand for the “green and good” to indicate production and consumption systems associated with a broader range of attributes, such as community-based efforts to build healthy, just and local food systems (Kloppenburg et al., 2000). Many consumers have become very sceptical about the behaviour of companies, as a result of the bad reputation of unsubstantiated “green” claims in the early 1990s (Peattie, 2001; Reinhardt, 1998). Moreover, the virtually unchecked power of multinational food companies has raised new questions about the proper governance of global environmental issues (Tansey and Worsley, 1995).

For the reasons outlined above we considered it timely to devote IVM’s 6th Lustrum Conference to diverging interpretations of food sustainability, with food security, food safety, and governance as the three key themes. Below is an account of that conference and its main overall conclusions.

**Food security**

The challenge of food provision is that billions of lives are at stake. According to Vaclav Smil (2000) (University of Manitoba, Canada) there are no fundamental biophysical obstacles to feeding ten billion people by 2050. Responsible use of available resources could almost accomplish this and, additionally, it may be expected that scientific progress will be able to bring about a substantial reduction of environmental impacts. Nevertheless, many societal, technical and ecological challenges remain. This may lead to a prediction of catastrophes, many of which are foreseen to be aggravated by exactly the same scientific progress — including modern biotechnology — that some see as the ultimate solution. Without going into all these potential objections, Smil (2000) stressed the wasteful management of existing resources, which is characteristic of all the links in the present food supply chain. According to his estimates the total slack in the system, primarily post-harvest losses, would almost single-handedly be able to feed one billion people. Brian Halweil (2002) (Worldwatch Institute, Washington, DC) was less optimistic. He advocated local production and consumption, rather than subsidised transport of food over huge distances (Halweil, 2002). He illustrated his point by showing two Dutch tomatoes which he had bought in Washington, DC the preceding day, at a price comparable to local produce. For those unfamiliar with the extent of current trade flows this was an eye-opener, which bought him the sympathy of those who feel there are more sustainable alternatives than economy-of-scale and long-distance transport increasing hand-in-hand. Martine Helms (Vrije Universiteit, Amsterdam, The Netherlands) is developing the methodology to assess the environmental impacts of present and future food systems at an aggregate societal level. By relating purchasing power, the proportion of animal products in the diet and in land use, she argued that the western-style diet should be an important target for efficiency improvement by a societal transition from animal to plant protein. From the same research programme (PROFETAS, 2003), Xueqin Zhu (Wageningen University, The Netherlands) presented a comparative LCA on pork vs. pea-derived Novel (plant) Protein Foods. She concluded that pork had a substantially greater environmental impact, in particular regarding acidification (27-fold) and
eutrophication (four-fold). Emiel Elferink (University of Groningen, The Netherlands) confirmed that the environmental consequences of meat production geared to large-scale overseas imports of feed crops such as tapioca and cereals is tremendous. In contrast, he noted that pork production on wastes from the food industry (such as beer and citrus) is efficient and unexpectedly friendly for the environment. Griet Heuvelmans (Leuven University, Belgium) adapted the traditional LCA approach by incorporating the effects of agricultural land use and the water balance, changing from the product to the crop rotation level, hence including explicit spatial and temporal dimensions. Thus, the aspect of future freshwater reserves and hydrological response are incorporated, yielding impacts such as drought risk, flood risk and downstream water availability. Sanderine Nonhebel (University of Groningen, The Netherlands) focused on land use and energy (Gerben Leenes and Nonhebel, 2002). She concluded that the best options to reduce the environmental pressure of food systems are found in reduction of:

- worldwide transport of food and feed;
- the use of artificial fertilizer; and
- the use of meat, ready-made and frozen foods, all of which consume considerable energy.

However, she cautioned that cattle are often reared on otherwise marginal land, which cannot be converted to cropland.

**Food safety**

Daan Kromhout (National Institute of Public Health and the Environment, Bilthoven, The Netherlands) stated that both hunger and obesity are unhealthy and that the numbers of people afflicted are presently comparable. Taken together, a quarter of the world population is involved. In his opinion, separating these health aspects from food safety issues is unbalanced and unwise. For example, according to recent calculations, 110 deaths might be avoided in The Netherlands (NFCA, 2002) by lowering acrylamide concentrations in potato chips and crisps. However, many more might be avoided by reducing saturated fatty acids and trans fatty acids concentrations in the same foods. His optimistic view that food has never before been as safe as today was not shared by Lucas Reijnders (University of Amsterdam, The Netherlands). The latter stressed the importance of both industrial mishaps and microbial food spoilage, which may be blamed, in part, on the consumer. His main conclusion was that, although some measures to improve food safety result in lower economic efficiency and lower sustainability, in many instances all three can be combined. Subsequently, the focus was on risk perception and risk communication. Irene van Geest (Food and Non-Food Authority, The Hague, The Netherlands) agreed with Kromhout on the present safety of food and discussed the increasing gap between science-based risk and public perception as a leading cause of food scares. In a marketing study, Fleur Laros (Tilburg University, The Netherlands) quantified the emotions elicited by food, comparing conventional, organic, functional and GM foods on 35 emotions. Her conclusion was that, probably due to differences in familiarity, consumers rate functional foods much more positive than GM foods. Marielle de Groot (Vrije Universiteit, Amsterdam, The Netherlands) studied government-citizen communication strategies. According to her results, both comprehensibility of the information and credibility of the source should
be considered important. However, information brochures did, but press releases did not reckon with factors modifying public perception. Jeanine van der Wiel (Health Council, The Hague, The Netherlands) explained the European safety assessment of novel foods, stressing the importance of transparency, which may conflict with industrial lack of openness.

**Governance**

So far, several trade-offs have been touched on. Good governance, be it from industry or from public authorities, is required to balance them. As might have been anticipated, a few more compromises were added by the presenters in this area. Highlighting political efforts in sustainable agriculture, Cees Veerman, the Dutch Minister of Agriculture, stressed the European political will towards phasing out the unsustainable production subsidies. Nevertheless, the EU will continue to support European beet sugar against Brazilian cane sugar, arguing disputably that the latter may endanger the rain forest. Referring to corporate efforts, Reid Hole (Corporate Director Food Safety, Nutreco) described how his company delicately manoeuvred between conflicting demands, balancing practice and theory, long- vs. short-term goals, citizen vs. consumer demands and competitive edge vs. transparency. Anniert Mauser (Unilever, Rotterdam, The Netherlands) explained additional corporate efforts in sustainable agriculture. In the mid-1990s Unilever launched its Sustainability Agriculture Initiative, translating the three perceived dimensions of sustainability (see above), i.e. economic growth, social progress and environmental protection, into ten indicators, finally resulting in strict guidelines for farmers and other suppliers. Agni Kalfagianni (Twente University, Enschede, The Netherlands) studied the politics and policy dimension of sustainability and health in food choice. She concluded that after a myriad food safety crises the EC efforts to restore consumer confidence by enhancing chain transparency is a tedious process. Nicolen van der Grijp (Vrije Universiteit, Amsterdam, The Netherlands) illustrated the principles of good governance with the case of sustainability labelling and certification in the fruit and vegetables sector. In agreement with the EC definition of governance: “the rules, processes and practices that affect how powers are exercised” (CEC, 2001), she regarded private international sustainability labelling and certification schemes as a component of multi-level governance. Indicating its weak spots, such as insufficient legitimacy, clarity, transparency, consistency and coordination, she recommended international public policymakers to improve these by increasing:

- public policy involvement;
- legal framework development for integrated agricultural production;
- international harmonisation; and
- assistance to developing countries, regarding private labelling and certification programmes.

Joyeeta Gupta (Vrije Universiteit, Amsterdam, The Netherlands) focused on the consequences of a lack of good governance and came to the conclusion that the ultimate problem is hunger in the world. In a vicious circle, poverty, lack of food, unsustainable food production practices and environmental degradation yield a downward spiral. Though right in theory, international institutions such as the World Trade Organization (WTO) often use wrong measures in attempts to stimulate farmers...
in developing countries to produce for their own population. Moreover, poor farmers are in danger of loosing control over their seeds as a result of WTO’s agreement on trade-related aspects of intellectual property rights. With regard to the latter (TRIPs), the paper by Gerard Downes (University of Limerick, Ireland) analysed their effects in detail. He concluded that certain firms in the seed industry enjoy monopoly privileges thanks to the TRIPs Agreement, which is at variance with the WTO’s aspiration of greater liberalization of trade. Nevertheless, he feels the greatest danger to food security in developing countries may come from the implementation of the UPOV Convention, which has been used by powerful states in bilateral, regional and sub-regional trade agreements as a means to ensure the compliance of developing countries with the provisions of the TRIPs Agreement.

Overall conclusions
The concept of sustainability in general and food sustainability, in particular, entails many aspects, many methodologies and many interpretations. During the conference a broad picture was painted and many key issues emerged, from ecology, economy and society. Consequently, with respect to both food security – the focus in developing countries – and food safety – primarily a preoccupation in developed countries, many potential trade-offs and opportunities for regional approaches were identified. Precisely for this reason, the star of democratic multi-level governance is rising rapidly. Transparency was identified as one of the main issues underlying good governance. In this respect it was generally considered an environmental liability that food production is increasingly in the hands of just a few corporations, all of which display a turnover easily surpassing the GDP of 60 per cent of the world’s countries. In order to improve the sustainability of food production, therefore, it is of the utmost importance that food multinationals transfer some form of democratic control over their global environmental policies.

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