

Sustainable supply chain governance systems: conditions for effective market based governance in global trade

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Abstract: In this article I discuss the conceptualisation and existing empirical research on the creation of sustainable global product chains. This paper sets steps in moving from normative prescriptive approaches towards an empirical descriptive approach, comparing available research in various forms of global markets and types of commodities and lifting the analysis to the level of ‘product channels’ (the collective level) instead of ‘product chains’ of collaborating individual businesses. It explores various strategies employed by businesses in international collaboration in product improvement and competitive mechanisms that may support the change towards more sustainable products sourced from developing countries. Recent research in the Dutch-South African value chain of fruits and wine are used as examples to illustrate the virtue of this three level approach. For a full understanding of dynamics in achieving sustainability in global value chains a multi-level theoretical approach is required combining empirical studies at firm level, at global value chain system level and at the level of global dynamics.

Keywords: supply chain management; sustainability; supply chain governance; developing countries; certification; value chain; CSR; global trade; industrial ecology.

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1 Introduction

Like in other North-western European countries, Dutch industries have substantially reduced their environmental impacts at home (60–80% in 1990–2005), while also strongly contributing to economic growth (+63% value added) (Vermeulen, 2007). However, a large share of all environmental impacts (30–55%) caused by Dutch

consumption is allocated in developing countries (developing countries), because products or their resources are imported (Nijdam and Wilting, 2003). This share is actually growing fast due to increasing imports (for example China's share of all EU-imports grew in 2001–2005 from 8.3% to 13.4%).

Western governments can not prevent this shifting allocation of impacts, as they are not entitled to address production conditions in developing countries. They have to walk the long route via supranational institutions (UN, OECD) with their weak implementation powers and await effective implementation of UN agreements by national governments. But actors in the market and civil society (NGOs) have been filling this 'regulation vacuum'. Early examples are *eco-label* and *fair trade* certification systems (since 1980s/1990s), mostly originating from NGOs and small businesses serving an ideological/ethical cause. They have not succeeded in conquering the mainstream of consumer markets (shares < 1–3 %).

More recent after 2000, other firms developed their own supplier control systems (Eosta, Tesco, Patagonia). Other multinational businesses, active in Developing countries, developed in-firm systems of control (Philips, Heineken), or cooperate in sector wide systems.

The common feature of such systems is that various market and often non-market actors cooperate in improving the environmental and social conditions of production operations in Developing countries. We call these *sustainable supply chain governance systems* (SSCG-systems).

The emergence of these systems in itself is remarkable. Common sense suggests that profit driven businesses focus on cost reduction and that highly competitive world markets do not allow any corporate philanthropy (Porter and Kramer, 2002). Lack of experience with environmental management by firms in developing countries further complicates communication between market actors. Still, these SSCG-systems do emerge, also in the mainstream of global markets.

This brings me to the key question for this article: "To what extent and under which conditions is business-to-business cooperation in world wide 'sustainable supply chain governance systems', together with civil society and governments, effective in improving environmental and social conditions of production operations in developing countries?"

The analysis of key conditions for such non state governance systems to breakthrough and their effectiveness is relevant both for economic and (environmental) policy sciences. These SSCG-systems represent a *double shift in governance*: from *state* towards *market* and from *national* towards *global* (Kersbergen and Waarden, 2001). In political sciences the *governance concept* is about "autonomous self-governing networks of actors", where "governments recognize that the capacity to get things done does not rest on the power of government to command or use its authority" (Stoker, 1998). Others referred to this as 'governance without government' (Rosenau and Czempiel, 1992). In addition, the 'global value chain theory' in economic geography explains the growing variety of network forms of *value chain governance* (described as 'markets', 'modular chains', 'captive chains' and 'hierarchies') (Gereffi et al., 2005) as crucial means in the global competition. The SSCG-systems are new forms, hardly studied yet and they differ because of their:

- focus on environmental and social-ethical goals
- their varying modes of NGO involvement

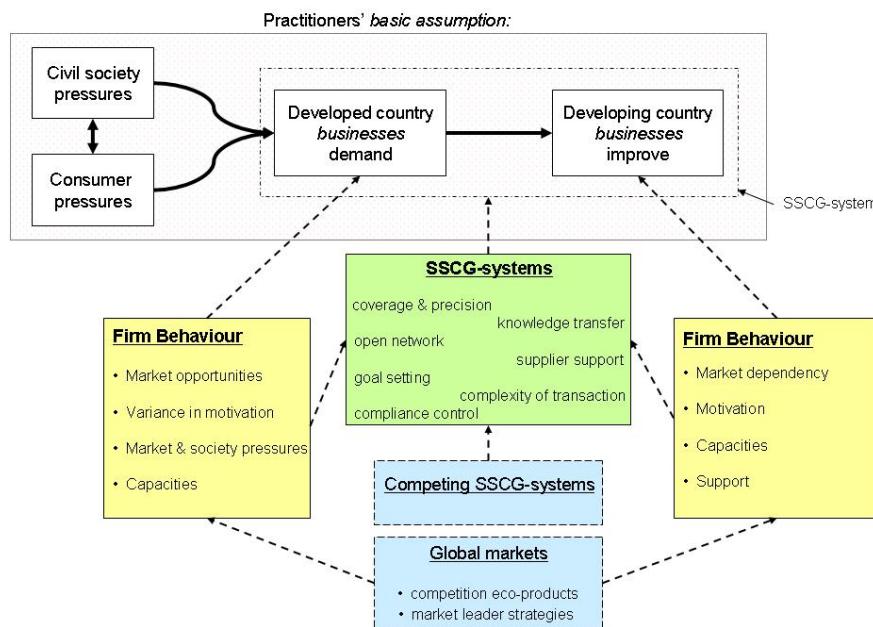
- various forms of third party coordination and control.

In order to understand their effectiveness both on the organisational level and on the firm level one needs to identify explanatory variables. In our view these relate to:

- the characteristics of the SSCG-systems
- supplying firms in their developing country context
- demand side firms in their western European context.

In this emerging practice the various actors involved (from market, NGOs and governments) implicitly or explicitly apply the *basic assumption* that business-to-business supply chain cooperation, geared by western consumer and civil society pressures, can be effective in improving environmental and social conditions in developing countries (see Figure 1).

Figure 1 Main sets of conditions for the effectiveness of sustainable supply chain governance systems (see online version for colours)



In this article we will elaborate this line of thinking, transforming it towards testable theory, using first results of exploratory studies and cases reported in literature. This is a complicated assignment as the phenomenon has gained attention in various disciplines, all with their own key questions and connected ways of reasoning. It is referred to as 'global trade value chains' as an economic and an economic-geographic phenomenon (Gereffi et al., 2005), while it is also presented by environmental scientists and environmental business management as an ecologic and logistic challenge (Quakernaat

and Weenk, 1993; Sarkis et al., 1995; Seuring, 2004). In this article we intend to make steps beyond these various perspectives in order to get a comprehensive set of assumptions explaining the level of success (in the sense of speed, impact and diffusion).

2 Global supply chains and market governance

As we stated in the introduction, the emergence of SSCG-systems in itself is remarkable. Why would economic actors take up such public interests (abating environmental degradation and social injustice)? Although economic theory states that wealth is created through the market, one would not expect public goods (like a healthy environment) to be an issue to be addressed in market transactions. The concept of the market implies entrepreneurial producers to create needed goods and services and present these on the market to be sold to the best bidding customer. Sellers and buyers compete on a crowded open and free market place and those that are able to combine the lowest price with the highest profit will survive. Though this ‘image’ of the marketplace is a core element in welfare economics, it presents a very rough simplification of reality. The process of serving consumer needs by producing and selling commodities is not by far a two actor game, but a much more complex social system.

Porter (1985) states that “every firm is nothing but a collection of activities that are performed to design, produce, market, deliver and support its product” and the value chain is “the whole series of activities business firms undertake to convert the raw materials or input resources to the goods and services required by a customer”. How efficient and effectively a firm performs these activities determines what quality of goods and services and at what cost the firm will be delivering to the consumers. The buyers pay the firm for the goods and services delivered (Porter, 1985).

So, in practice the value chain, or supply chain, does not exist of just one or two firms, but it is a social system of a larger number of firms, successively engaged in the sequence of activities, with finally an end consumer, each duo of actors linked by a sequence of markets with their transactions. The value chain starts with the mining of needed raw materials, and in economic theory, ends with the satisfied consumer. However, from the perspective of environmental science, analysing ‘product chains’ or ‘product life cycles’, the value chain does not end here: after the use of the products the disposal of post-consumption remaining of the products are collected, hopefully reused or recycled and to some extend they end up as sited waste, such steps again including economic activities. Increasingly, producers are held responsible for these activities as well (Vermeulen and Weterings, 1997; Scheer, 2006). From our perspective of understanding governance for sustainability in global product chains we use the concepts *value chain*, *supply chain* and *product chain* as synonyms, with the first two in literature often having a more limited scope, excluding consumer and post consumption activities [see also Vermeulen and Ras, (2006), p.247].

The interactions and cooperation between each firm in the value chains do take different forms. In his classical work Williamson already distinguished various basic forms of dealing with costs of transactions, depending on the type of product traded, with repeated case-by-case bargaining (*spot markets*) on the one hand and relationship-specific *contracting* on the other hand. Also strategies of backward and forward integration are used: getting full control by taking over supplying firms or firms engaged in the

production or selling of products). These strategies, also called verticalisation, are seen as comparative strategies in the value chain creating *hierarchy* (Williamson, 1975, 2008).

So, in practice value chain systems are structured in different ways, varying from systems as a sequence of anonymous markets, with firms in each step communicating only via market transactions to fully controlled and centrally managed relations. In their article on governance of global value chains Gereffi et al. (2005) distinguish five types of global value chains:

- 1 *Markets*: the various links in the chain are sequences of market places, all having the nature of a market, where both parties, seller and buyer can easily switch after each transaction
- 2 *Modular value chains*: where suppliers produce products on suppliers' specifications, but the supplying producers take full responsibility for the organisation of their link in the value chain
- 3 *Relational value chains*: with intensive interactions with mutual dependency for both seller and buyer and concerning products with a high level of asset specificity
- 4 *Captive value chains*: with many small suppliers dependent on small numbers of much larger buyers
- 5 *Hierarchy, vertical integration*: implying all supply activities being owned by the final product manufacturer all interaction taking place via management control from the headquarters to subsidiaries.

In an earlier article Gereffi (1999) distinguished between producer-driven and buyer-driven value chains, showing that the issue of structuring the value chain and taking the lead is actually a key strategy in the global competition.

In a comparable way Hughes (2005) suggested three contrasting modes of organisation of ethical monitoring being used by retail companies: *the arm's-length approach* (describing contractual relations with weak social tiers and price based forms of competition), the *coordinated approach* (with more collaboration and trust and closer interpersonal ties), and the *developmental approach*, each holding contrasting implications for suppliers and workers at production sites. The first category fits within the first or second type of supply chain as described by Gereffi, while the second is a form of a relational value chain. However, the third category may be an addition to Gereffi's typology, where *developmental supply chains* add to strong cooperative relations also the implementation of ongoing programmes of mutual learning on the part of retailers and overseas suppliers, and apply inclusion of local stakeholder groups into the governance systems [Hughes, (2005), p.1158].

The issue of global competition between value chains clarifies that the concept of value chains, or supply chains, is rooted at the level of cooperating individual firms. This puts the analysis of the strategies, capabilities and performance of each of the interlinked firms on the agenda.

However, for a proper understanding we do have to look at the full spectrum of these value chains in a specific sector, or in other words, for a specific group of products. For this we use the concept of a *product channel*, as consisting of a collection of different product chains. In specific global product channels we can see competing value chains, each structured in a different way. Focussing on the full product channels (instead of individual chains) connecting specific countries in Europe with specific countries in the

developing world, we often see a small number of dominant market leaders, cooperating with a limited number of exporters in the developing countries. In various agro-markets global trade is actually dominated by very small numbers of businesses, like 80% of the global banana and the cocoa trade each being dominated by just three firms and 85% of the global cereals trade by six firms [Auroi, (2003), p.27]. These major players possess strategic positions in global trade. Any communication on improving production conditions requires their cooperation and commitment.

This is actually where the *history* of global sustainable supply chains has started. Small 'enlightened' entrepreneurs, often with a history in civil society, started at first to bypass these dominant mainstream value chains. Fair trade initiatives started to create new and shorter value chains, more directly linking small producers in developing countries with western consumers, first in the late 1970s and 1980s. For this, new cooperatives have been created and new distribution systems in countries like the Netherlands. In the same way trade in organic products has been organised in separate value chains, bypassing mainstream firms. In both cases control systems for securing quality, both related to product quality and environmental and social responsibility throughout the value chain have been developed and implemented (like Max Havelaar and EKO), including better prices for small farmers in developing countries (Kilian et al., 2004; Ims and Jakobsen, 2006; Raynolds et al., 2007; Bitzer et al., 2008).

In terms of Gereffi's categories these early examples are *relational value chains*, and can be seen as buyer-driven value chains, where western buyers impose their environmental and social-ethical requirements on the suppliers, in this way contributing to their welfare in terms of better profits and living conditions.

In the last decade also examples of captive and hierachal value chains have emerged, where multinational corporations have adopted the *OECD Guidelines for Multinational Enterprises 2000*, which states that these enterprises have to address sustainability issues over the full life cycle of their products (Chapter V-3) and adopt environmental practices in all parts of the enterprise that reflect standards in the best performing part of the enterprise (Chapter V-6) (OECD, 2000). Dutch multinational enterprises (like Heineken, Akzo, Shell and DSM) have, with different levels of success, implemented in-firm systems of control throughout their verticalised value chain, applying the same environmental management system in developing countries as in the Netherlands (Bakker et al., 2004; Jeppesen and Hansen, 2004; Cramer, 2008).

3 Variations in SSCG-systems

In this article we focus on *Sustainable Global Product Chains*, excluding verticalised hierarchical value chains.¹ In the emerging practice we can distinguish three types of supply chain governance: single firm approaches, joint product sector approaches, and cross sector approaches.

Single firm approaches: first generation

Some individual firms are taking the lead in improving both social and environmental conditions in all steps of the value chain. In doing this they have to take a series of steps: identifying relevant issues in each link of the chain, which requires analysing these conditions at all suppliers. Based on this, one needs to identify possible improvements

and elaborate feasible forms of implementation of these and finally a form of control on the compliance to agreed improvements needs to be organised (de Groene and Hermans, 1998).

In an previous article we discussed experiences of a Dutch shoe manufacturer Van Bommel discussing improvements with his Indian leather suppliers [Vermeulen and Ras, (2006), p.253–254]. This globe wide interaction is often a difficult job, as supply chains in most cases consist of large numbers of suppliers in various developing countries and such inquiries about social and environmental conditions are often misunderstood by suppliers and seen as unwelcome interference with their business.

Yet, the early examples of fair trade have shown how improving production conditions can be achieved, also by organising collectives of smallholders and creating independent export companies (Kessler et al., 2003; Parrish et al., 2005).

Also examples from more mainstream firms do exist, like in the cases of the outdoor equipment producer Patagonia or online shop OTTO, that converted its cotton supply into organic produce (Chouinard and Brown, 1997; see also Goldbach et al., 2003; Kogg, 2003).² For individual firms this implies substantial extra transaction and control costs.

In another case, the Dutch coffee producer Peeze, mainly supplying the catering industry with high quality coffee with their own ecolabelled product, these control costs seem to be manageable, because this company directly surveys its own suppliers already for quality control purposes. In this control an additional assessment of sustainability issues can easily be added. However, in many cases other agencies are used to perform such logistic tasks in the sourcing countries (Hughes, 2005). These other actors have to be motivated and it raises extra costs.

Yet, even further going forms of individual supply chain cooperation are a possible. In the Netherlands a price winning import firm of organic food, Eosta BV, has proven the feasibility of full farmer to consumer transparency on social and environmental issues.³ This firm uses existing ecolabel systems as minimum requirements for their suppliers, but created its own additional environmental, social and quality standards, connected to its own certification scheme ‘Nature&More’. Consumers can, by using a code on the product, see the individual stories on these issues for every individual supplier in the developing world. Eosta also works with their own representatives, who regularly are visiting all farms in numerous countries around the world. In addition, the firm works with different premium prices connected to the farms performance on these issues (environment, social and product quality).

One of the disadvantages of these individual firm approaches is the reliability of the business to business self control and their claims on sustainable practices, which might easily be questioned by individual consumers or NGOs.

Joint product sector approaches: second generation

Joint approaches have been developed in different ways, which may reduce the problem of reliability. Originally, forms of eco-labelling assured independent control and do have other advantages for individual firms in their interaction within the value chain. Improving sustainability of specific products has been seriously addressed in the environmental policies of many Western countries since the 1990s (Tukker et al., 2001; van Hemel and Cramer, 2002), and as a part of these policies, environmentally friendly products have been supported with ecolabelling systems since the mid 1980s (Cramer

et al., 1995; OECD, 1997; Vermeulen and Weterings, 1997; Vermeulen, 2002). These systems for ecolabelling include environmental requirements in all relevant steps in the value chain applying the environmental life cycle approach (Heijungs and Guinâee, 1992; Guiné, 2002). These are all early forms of value chain governance, mainly initiated by third parties (often representing state, environmental organisations and market) and including independent auditing.

In the case of governance with third party ecolabelling two new actors emerge in the producer-buyer relations (the ‘buyer’ might now be the end producer or the retailer): the eco-label organisation and the audit-organisation. The advantage for the buyer is that he does not have to make all the steps described under the single firm approach. In practice, for the retailer to purchase ecolabelled products (also from developing countries), the firm doesn’t have to inspect all suppliers himself, but he can expect to rely on a well established third party control of the supplier. The existence of independent third parties also provides legitimacy and trust. In these cases the producer is actually paying for this control to the ecolabel organisation and their accredited auditors, so the buyer can transfer transaction costs down the supply chain. However, in the case of organic or ecolabelled produce, extra costs maybe included in higher prices sold, but this depends also on the mechanism of pricing in these specific markets. In theory, the suppliers’ advantage is that a better product price can be achieved. In Fair Trade systems these higher prices for (smallholder) producers is actually part of the transaction agreements ([Ims and Jakobsen, 2006](#)).

This mechanism of reducing transaction costs with joint third party approaches has been developed in various ways and has also penetrating in the mainstream of product channels, where market leaders have started creating their own value chain governance systems, sometime separately, some times jointly with some competitors and sometimes sector wide. One example is the introduction of Marine Stewardship Council, by Unilever, in cooperation with World Wildlife Fund, regulating sustainable fishery, which successfully gained recognition and support by leading supermarkets ([Constance and Bonanno, 1998; Cummins, 2004](#)).

In the Dutch coffee market, after the initial Max Havelaar Fair Trade and EKO coffee initiatives, various mainstream retailers and coffee producers in the Netherlands introduced Utz Kapeh, as their competing firm-based certification system in 2000, with less strict requirements.⁴ After initial success the scheme has been renamed Utz Certified and is being extended to cocoa and palm oil.

This sequential emergence of certification schemes is just a small part of the story: in the world wide coffee market many competing coffee schemes have emerged, each creating a different governance system (see also [Kilian et al., 2004; Raynolds et al., 2007; Bitzer et al., 2008](#)).

These examples clarify that value chain governance is getting more and more diverse, also including more then just market actors. Additional players in the game are the ecolabel organisations and their auditors. The first of these are sometimes government initiated organisations (in Germany), sometimes mixed government, market and civil society organisations (in the Netherlands) and sometimes civil society or market based organisations (in Australia).⁵ The auditors are mostly commercially contracted firms. Finally, we see an increasing number of market based certification systems, sometime with connections to NGOs.

It would be a misconception to assume that these developments are mainly occurring in the developed countries. The long list of ecolabel organisations includes also many

cases in developing countries, including India, China, Brazil, Philippines, Indonesia and Thailand. Also sector specific examples exist in developing countries. One such an example is the Integrated Production of Wine scheme in South Africa, a sector wide form of environmental self-regulation of wine producers. Participating wine producers have to comply by handing in an annual self-assessment report on their practices and are externally audited on a 2–3 years base. With this system, South African wine producers are mainly addressing the European wine vendors, communicating about both quality and issues of environmental and social responsibility⁶ [McEwan and Bek, 2006; Ras et al., (2007), p.410].

Cross sectoral approaches: third generation

A third form of sustainable supply chain governance goes beyond specific products and sectors and has been designed to be widely applicable in a uniform way. The most extensive example of this is GlobalGAP. It is a voluntary global partnership of market-based members, aiming at world-wide harmonising the application of Good Agricultural Practice (GAP). It was initiated in 1999 (as EurepGAP) by Western European retailers in response to civil society and media attention to sustainability issues related to food consumption. It developed voluntary standards for the certification of agricultural products around the globe, to be used by retailers and their sourcing agencies in the contracting of producers of specific produce. Producers are audited for compliance on a yearly base. It aims to reassure consumers about how food is produced on the farm by minimising detrimental environmental impacts of farming operations, reducing the use of chemical inputs and ensuring a responsible approach to worker health and safety as well as animal welfare. It claims to work on the basis of an equal partnership of agricultural producers and retailers who wish to establish efficient certification standards and procedures. GlobalGAP covered over 81,000 certified producers in more than 80 countries in 2007, a fast growth compared to the 18,000 producers in 2004. Certification schemes have been developed for crops (fruit, vegetables, green coffee, tea and flowers), cattle (sheep, pigs, dairy and poultry) and aquaculture products (salmon, trout and shrimp).⁷ In the development of the standard documents they have invited both producers, civil society (development and environmental NGOs) and scientists.

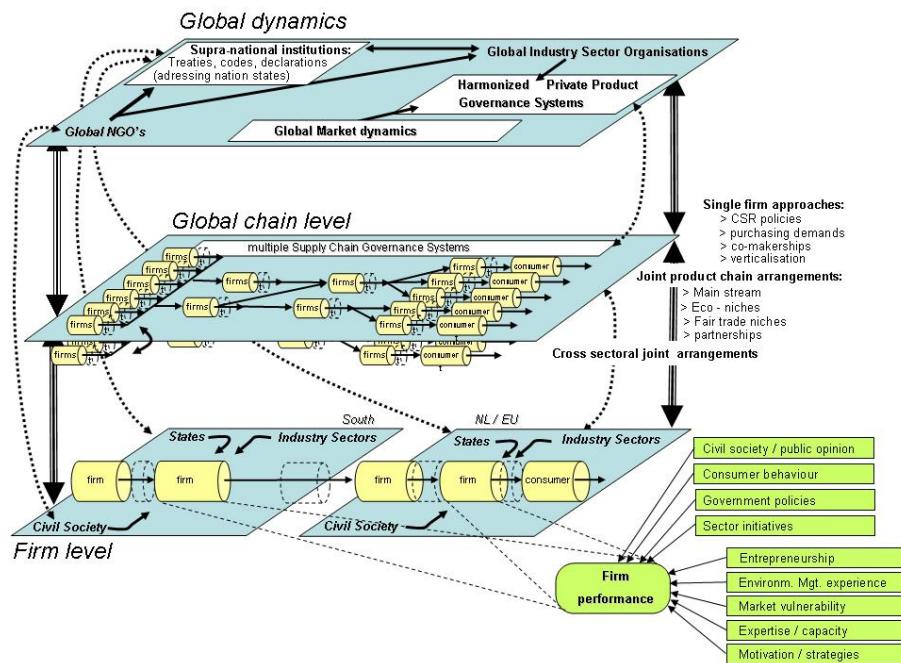
The various examples of sustainable supply chain governance clarify two aspects that have hardly been addressed in the general analysis of value chains: *first*, these varying forms of interaction, cooperation and compelling rules in the value chain are an instrument of competition, partly based on specific quality assets of the products (namely the environmental and socio-ethical performance of value chain partners); and *second* these forms of interaction and cooperation include other types of societal actors: apart from newly created non-profit governance institutions and their (for profit) auditing and control bodies also consumer NGOs, development NGOs and environmental NGOs play diverse roles. On a distance governments play a role, partly in supporting these developments and by taking the existence and assumed effectiveness of these forms sustainable supply chain governance as a point of departure for new forms of sustainability policy.

In the fact that firms and NGOs are the main initiators in this field, and that European governments are increasingly supporting this development, we can derive the observation that all practitioners (market, NGOs and governments) apply the *basic assumption* that business-to-business supply chain cooperation, geared by western consumer and civil

society pressures, can be effective in improving environmental and social conditions in developing countries (Figure 1).

This multi-actor characteristic of global sustainable supply chain governance calls for a theoretical approach that acknowledges the plural network nature of such new modes of market based governance. Coe and Hess stress this issue in their work on global production networks, where they emphasise the embeddedness of production networks: namely, by analysing how they constitute and are being reconstituted by the economic, social, and political arrangements of the places they inhabit. This also implies that the influences of a range of non-firm institutions (like supranational organisations, government agencies, trade unions, employer associations, nongovernmental organisations and consumer groups) in practice also shape firm activities in the particular locations [see Coe et al., (2004), p.1207; Hess and Coe, 2006]. In a comparable effort of theory building Lazzarini et al. (2001) proposed integration of supply chain and network analysis in the 'Netchain analysis', arguing that both (vertical) supply chain optimisation and cooperation in (horizontal) social network are sources of value creation.

Figure 2 Three levels of analysis (see online version for colours)



For understanding the emergence of specific forms and the impacts of these various practices in global sustainable supply chain governance, we need to focus our analysis on three levels: the level of *individual firms*, the level of the supply chain wide *governance systems* and the level of the *system competition* between supply chain governance systems on the global market.

With the analysis of the role of single firms, we need to explain both the behaviour of firms operating with their single firm approach, of firms initiating or actively contributing to collaborative approaches, firms that enter pre-developed systems later on and finally of firms that ignore these developments and continue doing business as usual. A distinction also needs to be made between firms at the demand side (mostly in developing countries) and firms confronted with these business-to-business control systems in developing countries. Figure 2 shows this at the bottom level. In the next section we will focus on each of the required elements of analysis.

4 Addressing the effectiveness

The phenomenon of governance for sustainability in global value chains integrates two general ambitions: that of profitable value creation by all market actors involved and that of improving sustainable development for all stakeholders at all stages of the supply chain. So, analysing the effectiveness of these global multi-actor governance systems implies the use of a multi-dimensional yardstick for assessing effectiveness.

From the perspective of traditional economic value chain analysis or supply chain analysis, one can very well take the perspective of a single (dominant) economic actor (at the firm level of analysis) and determine the conditions for optimum value creating for this actor.

But, with shifting our analysis towards the level of supply chain systems and connecting it to the concept of sustainable development, this brings in the question of distribution of costs and benefits, beyond the individual firm level. Successful SSCM-systems are about *collective value creation* and *sustainable development*. Both end goals can in principle be measured, but only with serious complications. The distribution of value creation throughout the chain is a core strategic issue for firms involved and data collection will be extremely difficult, because of strategic implications and trust in supplier-buyer relations.

Measuring the contribution to sustainable development implies the use of large sets of social and environmental indicators. Determining the environmental impacts in themselves can only be done with delays and even then one encounters difficulties in attributing them to a specific firm and its activities. Facing this, it is common practice to think in terms of a sequence of impacts: starting with adjusted firm activities → reported activities → measurable physical results at firm level → physical impacts on eco-systems → impacts on humans. In this sequence, measuring effectiveness ideally would focus on the last two steps, but because of methodological complications often measurements at the first two or three steps are used ([Vermeulen, 2000](#)). In measuring the effects of new institutions and instruments the focus also often shifts to the appropriateness and functioning of these institutions and instruments themselves.

Here, for the case of global SSCG-systems a combination of deductive and inductive approaches can be applied. As a first deductive step, using the global consensus in general terms on what sustainable development should be about, the overall topics that are considered relevant can be determined. As a second inductive step, the large sum of specific items in these relevant topics, can be identified by means of content analysis of all the existing certification schemes. With this the relevant coverage of each single system can be determined.

Following the first deductive step, we need to start with the 1987 report of the Brundtland Commission, where sustainable development is defined as development that “meets the needs of the present generation without compromising the ability of future generations to meet their own needs”. The concept was explicitly intended to combine the globally shared ambition of supporting development in developing countries in order to reduce the extreme differences in welfare levels with the ambition to safeguard the vulnerable eco-systems, both because of their intrinsic value and their value as life support systems for all human societies. The definition in itself was not very operational and has caused many discussions among scientists and practitioners (Jamison and Baark, 1999; Dietz et al., 2005; Kates et al., 2005). But in practice, the concept is generally (Vermeulen, 2000) used as a steering concept or a long-term policy goal or ideal for society as a whole. It clarified that the sustainability challenge asks for (fundamental) transitions of society and calls the various societal actors to translate it into specified changes required in their sectors in society. These have been highlighted in a far less often cited fragment of the original Brundtland-report, stating: “In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development; and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations” [WCED, (1987), p.46]. Implementing SSCG-systems is one way of responding to this call.

The various global assessment reports (Kates and Parris, 2003; Millennium Ecosystem Assessment, 2005; UNEP, 2007) have further clarified the main so-called ‘search directions’ for the environmental dimension of this global process of change as being directed towards:

- multifunctional use of eco-systems and safeguarding of remaining unaffected eco-systems
- balancing the provision of growing food needs with sustaining biodiversity and the regenerating capacities of agro-ecosystems
- converting ongoing urbanisation and urban sprawl into healthy and liveable (mega)cities
- transforming mobility systems and infrastructures into low impact and space efficient systems
- efficient use of depleting resources
- shifting towards economies based on renewable energy sources
- creation of maximum closed loops of material use in economies.

Global consensus on the social dimension has resulted in the Millennium Declaration of the United Nations General Assembly. In September 2000 the General Assembly has adopted some 60 goals regarding peace; development; environment; human rights; the vulnerable, hungry and poor (United Nations, 2005).

These environmental and developmental goals cannot be realised without societal transitions and have also been translated into general industry directed reference systems,

like ISO 14001, SA 8000 and the GRI Guidelines (Global Reporting Initiative, 2002; AccountAbility and WBCSD, 2004; International Standard Organisation, 2004).

Using such global documents we can integrate the various indicator sets debated in environmental sciences into a *comprehensive reference set*, to be used to determine the level of issue coverage of each specific SSCG-system. Various researchers have made first steps in this direction which can be used as a first draft (Schmidt et al., 2004; Kates et al., 2005; Labuschagne et al., 2005a, 2005b). This allows us to describing the *issue coverage* and *precision* (the level of detail in prescribing actions) of all existing systems.

In addition is it necessary to test the compliance by individual firms' connected to the systems. This can be analysed by measuring the managerial responses with performance measuring in two steps (Coglianese and Lazer, 2003): first looking at the availability of in firm management systems, addressing these issues and secondly sample wise testing the factual degree of implementation of specific prescribed actions.

5 Understanding SSCG-systems' performance

For understanding the impacts of supply chain governance *characteristics of SSCG-systems* will offer the first set of explanatory variables. In the debate on governance for sustainable development it has been stressed by many authors that some of the key characteristics of the required societal changes are that the involved multi-actor networks are facing long term challenges for substantive changes in resource use, which require entering still unbeaten paths of technological development, which also implies related social and institutional transformations. The directions of change in physical processes have been discussed in Section 4 as the *search directions* for sustainable development, which include *five common elements* relating to the social dynamics:

- they require influencing the main driving forces of change: population growth, technology development and *production and consumption patterns* as well as spatial developments (land-use and urban, regional and infrastructure development)
- they require the *development of new applied knowledge and technology* and *knowledge transfer* to others (within national societies and between the developed and the developing world)
- they require *balanced decision-making* by various relevant actors in society: governments, businesses, NGOs, citizens, consumers, and experts
- they require *competing claims and interests to be addressed* in the institutions that govern the various local, regional, national and international societies
- they require a *link between long-term perspectives and short term policies and actions* (see also).

For the assessment of supply chain governance systems these common elements also serve as a reference. These systems do address production and consumption patterns. For enhancing sustainable development they need to contribute to applied knowledge development and transfer and to creating more balanced decision making by the various

actors engaged (both in individual firms and in the governance institutions). Essential for success is the level of *mutual learning and knowledge transfer* enabled by these forms of multi-actor governance (Bressers and Rosenbaum, 2003; Lafferty, 2004).

The institutions, being the SSCG-systems then are also expected to have mechanism for addressing competing claims and interests at stake. Using the work on multi-actor governance for sustainable development in *environmental policy sciences*, our assumption is that more *inclusive* and open *network relations* (market and non-market actors) will result in more comprehensive *problem perceptions and objectives* (wider coverage of issues, more precision). A second assumption is that joint employment of knowledge and power resources enables the application of more effective *instruments* for rule setting and compliance control.

Finally SSCG-systems need to include a mechanism of linking long term requirements via forms of continues improvement to short term step wise approaches.

Comparable conditions are suggested in economic geography, adding one additional key determinant for effective value chain governance: the need for effective provisions for reducing the *complexity of the transactions*, that are the result of difficulties in codifying requirements (Coe, 2004; Gereffi et al., 2005; Hess and Coe, 2006). This key determinant is especially relevant because of the complexity of the manifold environmental and social-ethical requirements and their debated nature. Can all involved actors make sense of it and communicate is successfully to consumers and civil society at the demand side?

For determining these assets of SSCG-systems and their relevance for effectiveness comparative studies are required, describing the wide variety of systems on these parameters. Little of this work has been done yet. In an article comparing various governance systems in the trade of forest products, Visseren-Hamakers concludes that many of these competing systems emerge ad hoc and ad random, generating relatively little effect in the sense of protecting forests, but have been useful in creating new niche markets for sustainable products and actually do fill a gap where governments are unable or unwilling to implement and enforce policies (Visseren-Hamakers and Glasbergen, 2007).

6 Conditions for supply side cooperation

For further explanation of the effectiveness of SSCG-systems we need to analyse the *supply side firm responses*: under which conditions will they participate and improve the conditions of their production? Based on some first available studies our assumption is that suppliers' responses depend on three key sets of variables: *market dependency, motivation, capacities* (Vermeulen and Ras, 2006; Ras et al., 2007; Zhu et al., 2007).

- *Market dependency* refers to the power balance in supplier-buyer relations: can suppliers choose to deliver to others? This closely correlates with the nature of the SSCG-system involved and the demand side lead firms.
- *Motivation* for compliance to SSCG-system requirements includes considerations of market opportunities, managers' views on corporate social responsibility and responses to external pressures (government, local, NGOs). The allocation of costs and benefits of sustainable supply chain governance will be an important consideration for suppliers.

- *Capacities* refer to supplier's level experience with environmental and social management systems and their ability to quickly adjust their production practices to changing market incentives.

To illustrate these first variables, we first have to look at the position of producers in developing countries that intend to supply to the global market. Their position has undergone major changes in the last decades. In their article on the trade in fresh vegetables between Africa and the UK, Dolan and Humphrey have shown how the supply chain transformed from more or less 'market governance' with many smallholders supplying to via local exporters to the UK market in the 1980's, into far more tightly knit *captive* and *relational* supply chains. In these developments individual supplying farmers become more and more dependent on a small number of export companies that are closely cooperating with a small number of large European retailers. These retailers increasingly developed supply governance systems ensuring supply continuity and controlled quality of the products. Introducing certification schemes for sustainable products is a substantial part of this strategy. In this process, they state:

"The product and process parameters of UK supermarkets changed the roles of exporters and producers, forcing them to acquire a range of new capabilities to retain their UK business. (...) At the same time, the imperatives for rapid and reliable delivery placed pressure on African exporters to gain greater control over logistics by stabilising handling and transport costs, particularly airfreight, which could amount to half of the total cost, insurance, and freight export cost."

[Dolan and Humphrey, (2004), p.501]

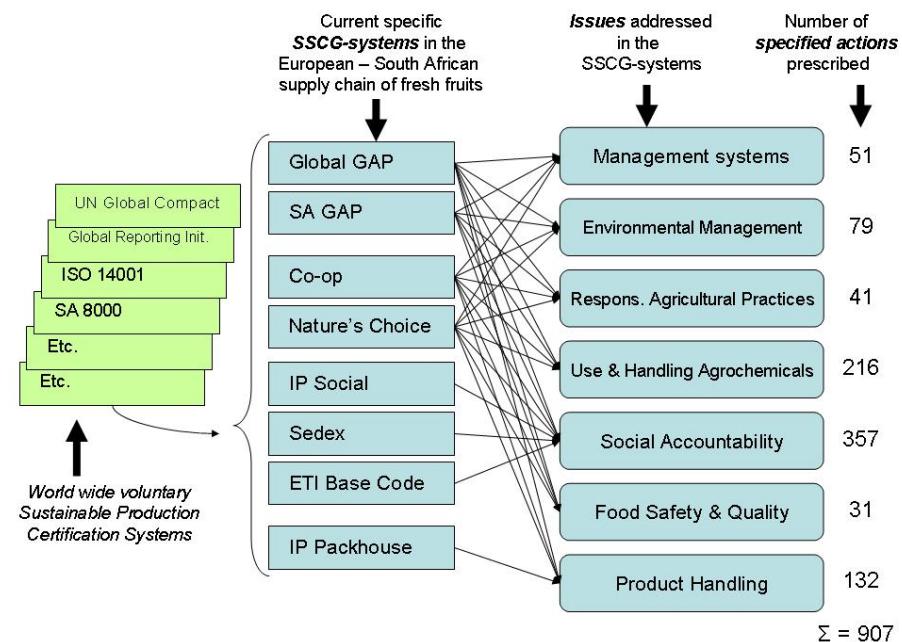
They continue with showing that production moved away from smallholders to large farms, many of which were owned by the exporters. By 1998 four of the largest exporters in Kenya sourced only 18% of their total produce from smallholders. This stemmed partly from the perception of supermarkets that smallholders could not meet process controls, such as food safety and pesticide regulations, and partly from exporters, who were concerned about the costs entailed in monitoring large numbers of small farmers. Those smallholders that remained in the value chain were organised into grower schemes with a high degree of supervision by the exporters [Dolan and Humphrey, (2004), p.501], illustrating the relational nature of these supply chains.

The GlobalGAP system which we discussed before, developed for food products jointly by the main European supermarket firms, may currently be the most elaborated example of such close knit relational supply chain governance. It poses a long list of detailed sustainable production requirements to all suppliers world wide. Non-compliance by suppliers results in termination of supply contracts and makes it very powerful. Our research in 2007 in the table grape industry in South Africa reveals the impact of this system: 95% of the export oriented fruit producers comply with these GlobalGAP requirements (Ras and Vermeulen, 2008).

However, exporting producers in developing countries are in practice exposed to various competing SSCG-systems (see Figure 3). At the one hand they are exposed to general (not sector or product specified) voluntary certification systems (like the UN Compact, ISO 14001, SA 8000 etc.) (see the left side in Figure 1) which can be applied on their own initiative. These systems apply to the firm as a whole, yet businesses are increasing demanding compliance to these to their suppliers. At the other hand the aforementioned sector and product specific certification systems have emerged. Figure 3 illustrates the practice of these systems in the South African-European supply chain of

fresh fruits in 2007, the classes of issues addressed and the sum number of specific activities described in all these systems. Individual suppliers have to monitor all these activities on a regular basis.

Figure 3 Magnitude of specified actions prescribed in current specific SSCG-systems in the European-South African supply chain of fresh fruits (see online version for colours)



This illustrates the growing complexity of business to business interaction in global supply chains and poses the question of motivation for supply side firm to enter or continue supplying to European export channels. Little empirical work has been done in this field. However looking at some of the studies addressing suppliers we can show a concise list of advantages and disadvantages of supplying ‘sustainable goods’, as reported by producers themselves [see Wycherley, (1999), p.124; Ytterhus et al., (1999), p.124; Hall, (2000), p.461; Ras and Vermeulen, 2008].

<i>Advantages of sustainable product supply</i>	<i>Disadvantages of sustainable product supply</i>
better prices then domestic market	Decreased autonomy
competitiveness through fulfilling standards	Increased information and transaction costs
continuity and stability of relations	
new business opportunities	
increasing effectiveness of applied innovations	
buyers' assistance / access to best practices	
knowledge	

Some first research in this field, connecting motives, production practices and environmental performance have been done in the global supply chain of automobile industry. Zhu et al. (2005) studied the responses of the Chinese automobile industry to demands from upstream western costumers (European automobile producers) on issues of environmental performance (either as specific product requirements or in the form of demanding ISO 14001 certification on plant level). Chinese producers are feeling customers' pressures, but also make their own assessments of the growing demand for sustainable products, both in the domestic and the international market. They tested various explanations for the environmental performance, applying multiple regression models, linking various *drivers for sustainable production* (regulative, market, supplier and internal motives) with both *operational practices* (such as implementing environmental management, green purchasing, customer cooperation and sale of recyclables and eco-design) with good *performance* (environmental, economic and operational). They conclude that from these different explanations only firm-internal motives partly explain specific *operational practices* (investment recovery by sale of recyclables) and that the various *operational environmental practices* (especially internal environmental management, customer cooperation, investment recovery by selling recyclables and application of eco-design) account for positive *environmental and economic performance* (Zhu et al., 2005).

This being one of the few empirical studies going beyond individual case descriptions, makes it clear that more research is needed in identifying the conditions for successful participation in global trade of sustainable products from the perspective of supply side firms. Especially the required capacities and the need for assistance in adapting to the complex demand side requirements need to be analysed.

7 Demand side dynamics

The third element in explaining the effectiveness is *demand side firm behaviour*. Here we expect *market opportunities*, *motivation* and *capacities* to be the key variables. We distinguish two routes of firm activity. On the *first route* are the innovating frontrunners, often being small sized entrepreneurs perceiving sustainable business as a competitive advantage. The Natural Resource Based View of the firm suggests that product stewardship offers firms opportunities for achieving sustained competitive advantage, but this requires very dedicated capabilities, skills and experience [Hart, (1995), p.1001]. This competitiveness argument has recently been tested and empirically been proven in a study of the relation between various environmental practices and economic performance of 52 leading ISO14001 certified companies in South East Asia. It showed that greening the different phases of the supply chain leads to an integrated green supply chain, which ultimately leads to competitiveness and better economic performance (Rao and Holt, 2005).

These front running firms mostly have taken the single firm approach (see Section 3), organising their own sustainable supply chain, as we argued with addition transaction costs, but creating their competitive advantage. In many cases their ecolabelled and fair trade products have been supplied to a small consumer market niche (often less than 1% of the sales in their product category). As we stated, creating legitimacy may be a problem for such fully market based governance systems, but in the cases of these

frontrunners, the initiators and their customers acted on the normative/ethical motives of fairness and accountability for environmental impacts. Also mutual trust is easily created in these relations [Ras et al., (2007), p.407]. This allowed higher prices and allocation of addition transaction costs at the consumer side of the chain. However, these niche markets proof to be very limited. Going beyond this small consumer group, issues of reliability and higher prices tend to become serious obstacles for success, so other businesses will have to develop other solutions for compensating additional costs and gaining trust.

On the *second route* we encounter mainstream (second generation) initiatives, responding to market and society pressures, that motivate them to go beyond regulatory compliance (Gunningham et al., 2004). Also on this route the question would be: why do these firms create SSCG-systems and why in their specific forms. There motives are more diverse, as they can be responding to increasing market shares of first movers, to public discourses, to various national policies in different countries, or even to foreign market initiatives or joint sector strategies developed elsewhere. In connection to this, no one-fits-all approach is available. A large deal of the literature about sustainable supply chain management actually is about creating and testing such approaches (Seuring, et al., 2003; Kotzab et al., 2005). Cramer has shown in a project with 12 companies in the Netherlands how an adoptive approach is required, enabling firms to respond to the various problems one encounters, when supply chain cooperation in the international supply chain is initiated. As problems she mentions: lack of supplier's willingness to cooperate, the organisation of compliance control, the issue of allocation of audit costs and creating legitimacy. She concludes that 'many companies cannot organise global chain responsibility by themselves' and actually need to join forces [Cramer, (2008), p.399–400].

As we saw, joint approaches are indeed emerging. Here we argue that many of these joint approaches result from a different motivation, connecting issues of sustainability with the competitive need for supplier control. European market requirements, both resulting from regulation (like regulation on the chemical residues on food, REACH regulations, etc.) and from consumer and NGO responses (like public scandals about cattle illnesses and child labour in developing countries) have motivated business to enlarge their supply chain control. In these cases, there is no ground for relying on trust in business to business relations and in business to consumer relations and for paying higher prices to suppliers, translating them into higher consumer prices. Their strategy would be of creating a wide range supply control system (including environmental and socio-ethical issues) and of allocating the additional transaction costs at the supply side of the chain. These varying points of departure affect the basic characteristics of their SSCG-systems, determining their objectives, inclusiveness, cost allocation and knowledge transfer.

Still, most businesses will rather be *adopters* than innovators, stepping into provided SSCG-systems. On their motives and experiences little is known yet, as research is not yet available.

In all cases, firms participating in SSCG-systems need to manage the additional complexity of communicating about the wide range of possible sustainability issues across (national and cultural) borders, calling for experience building and knowledge exchange (Koh et al., 2007).

8 The third level of the game: global competition

So far we mainly have discussed the creation of sustainable global supply chains as a two level game. The first being: the level of individual firms considering their response being a part of global supply chains, either at the demand or the supply side, and either being frontrunner or late adaptor, and the second level game being the various forms of multi-actor cooperation in specific supply chains. We showed that in specific country to country product channels these chains of producers are actually competing: the specific form of supply chain organisation is an important instrument in competition on the various domestic markets and extended quality claims in the field of environmental and social-ethical issues are instruments in this competition.

Yet, we have to add a third level to this conceptualisation. With the emergence of manifold supply chains governance systems in specific fields of products, the game is actually being moved to the level of global competition. This development has emerged most far-reaching in those product groups, which have the longest history of environmental certification, like forest products and coffee. Mutersbaugh has grippingly described this development in his article ‘Fighting standards with standards’, where he shows how the original relational standards are being replaced by multilateral institutions creating more general applicable globalised standards, thus transforming the supplier-buyer relations in ways that benefit certain actors (i.e., retailers) and imperil the earnings of others. Efforts to establish a single harmonised label (thus reducing the cacophonies of competing labels) need to build broad coalitions in order to be effective, but in doing so must include corporate interests that prefer weaker, contract-based standards (Mutersbaugh, 2002, 2005).

A comparable development can now be witnessed in the field of international trade of wine, where New Zealand’s, South African and Californian front running certification organisations are currently joining forces to establish a global uniform SSCG-systems based upon their experiences (Hughey et al., 2005; Silverman et al., 2005; McEwan and Bek, 2006; Bek et al., 2007). Here it is still to be seen whether it actually will lead to less ambitious systems.

9 Challenge for research cooperation

In this article, I have discussed the various approaches that are taken by market actors, sometimes in cooperation with non-market actors, in organising governance systems aiming at the improvement of the social and environmental conditions of the manufacturing and use of products which are produced in global supply chains. While global trade is strongly growing and a wide variety of sustainable supply chain governance systems is emerging, scientific research has just started picking up this issue.

Being a remarkable issue, this double shift in governance (from state to market and from national to global), the understanding of the dynamics of these complex social systems and the conditions for their successful contribution to sustainable development are eminent.

We demonstrated that the existence of market governance systems has attracted attention in various fields of scientific research, but that a comprehensive approach is still to be developed. Here we tried to set first steps.

It requires combining an understanding of the three levels discussed: the governance systems at a supply chain wide organisational level; the roles of various classes of individual firms both at the demand and the supply side and dividing them in frontrunners, main stream responders and late adaptors and finally the emerging dynamics on the global level.

Most of the work done in this field, addresses just one of these levels and in most cases based upon descriptive (comparative) case studies or suggesting and legitimising specific supply chain methodologies for individual firms.

A next step to be taken would be research including all elements shown in Figure 1 and developing a more quantitative approach for testing causal assumption, work that has yet been done by a very limited number of scholars (Rao and Holt, 2005; Zhu et al., 2005; Ras and Vermeulen, 2008). Applying such theory testing research in various countries and various product groups will result in better understanding of the potentials of market based governance of sustainable production in the global context.

Special attention will be needed for various issues identified in the studies discussed in this article. Some of these issues are the power relations between actors, the transaction cost allocation, the organisation of knowledge transfer and learning in supply chains and the reciprocity in SSCG-systems. The last refers to the participation of developing countries stakeholders in the creation of SSCG-systems and the formulation of their objectives and implementation strategies, which tend to be rather eurocentric.

Such analysis will give an empirical base for drawing conclusion about suitable roles for the national governments, civil society and multilateral organisations in these forms of governance.

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Notes

- 1 These are (nearly) one firm value chains, where improving sustainability is an intra-organisational activity, requiring another theoretical and empirical approach.
- 2 Here actually we could also discuss the literature on sustainable purchasing practices, as a step towards addressing these issues at least one step back in the supply chain, but for reasons of paper size we ignore this.
- 3 Eosta won the Dutch Corporate Social Entrepreneurship Award in 2004 and the Investors in People Award in 2005 (see www.eosta.nl). See for their farmer-to-consumer information system www.natureandmore.com.
- 4 On their website they write: "Fairtrade is a poverty reduction program that invites consumers to choose Fairtrade-labelled products and actively participate in social and environmental improvements by paying a premium price. The price paid by consumers for Fairtrade coffee goes to disadvantaged farmers to make them more prosperous. Market statistics show that the majority of consumers and companies are not willing to make this active contribution. UTZ CERTIFIED believes people want to continue buying their favorite brand for its quality, taste and price, while knowing that it is being produced in a sustainable way. UTZ CERTIFIED is about professionalism in coffee growing and traceability to ensure this." (Source: <http://consumer.utzcertified.org/index.php?pageID=211#>. See also <http://www.utzcertified.org/>).
- 5 See <http://www.gen.gr.jp/>.
- 6 See <http://www.ipw.co.za/>.