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A Modular Governance Architecture In-The-Making: How Transnational Standard-Setters Govern Sustainability Transitions

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A MODULAR GOVERNANCE ARCHITECTURE IN-THE-MAKING: HOW TRANSNATIONAL STANDARD-SETTERS GOVERN SUSTAINABILITY TRANSITIONS

ABSTRACT

Sustainability transitions have been studied as complex multi-level processes, but we still know relatively little about how they can be effectively governed, especially in transnational domains. Governance of transitions is often constrained by the equivocality of sustainability goals, the idiosyncrasy of niche experiments and the multiplicity of governance actors and interests. We study the role of transnational standard-setters in mitigating these challenges and governing sustainability transitions within a transnational sector. Our case is the global coffee sector where 'sustainability standards' are increasingly being adopted. We find that the emergence of a 'modular governance architecture' has helped diverse and heterogeneous actors turn sustainability from an ambiguous concept into a concrete set of semi-independent practices, while mitigating governance complexity. We show how standard-setters create governance modules through local niche experimentation, negotiate and legitimate their content with peers across local contexts, and re-integrate them into an emerging architecture. Our findings shed light on the role of modular processes in managing sustainability transitions and transnational governance, and the dynamics of meaning-making in this process.

Key words: sustainability transitions; transnational standards; experimentalist governance; coffee production; modular architecture; triple bottom line

Introduction

Scholars and policy-makers have increasingly urged for solutions to battle large-scale problems of transnational scope, such as environmental degradation and social inequality (Shrivastava, 1995; Bansal and Roth, 2000; Newton, 2002; Ansari et al., 2013; Garud and Gehman, 2012; Valente, 2012). This has created momentum around notions such as sustainability, poverty reduction, and equality. We focus here on the notion of *sustainability* which has attracted a growing group of scholars who study so-called "sustainability transitions", i.e. paths towards more 'sustainable' modes of production and consumption (e.g. Smith et al., 2010; Geels, 2010; Hess, 2014; for an overview Markard et al., 2012).

Sustainability transitions are complex multi-level processes that involve interactions and co-evolutionary alignments between socio-technical systems, landscapes, and niches (Geels, 2002, 2010; Kemp et al., 2007). To aid transitions, many scholars have argued that some degree of *governance* is needed, i.e. collective processes of steering (Smith et al., 2005; Newig et al., 2007) that include coordination among governance actors (Jessop, 2002) and deliberate intervention in local practice (Raven et al., 2010). Prior studies have focused on policy efforts as vehicles for governing sustainability transitions (Lauridsen and Joergensen,

2010; Romijn and Caniels, 2011; Raven et al., 2010). However, most of these efforts are bound to particular local, national or regional contexts. We still know relatively little about how policy objectives can actually be translated into "sustainable practice" across geographic boundaries in a whole sector – the main target of sustainability transition efforts. A better understanding of such processes is critical since governance of sustainability transitions is challenged by three major barriers: (1) the ambiguity of sustainability goals; (2) the limited applicability of often idiosyncratic niche experiments across contexts; and (3) the multitude of actors, agendas and interests involved in governance processes (Shove and Walker, 2007; Newig et al., 2007; Voss and Kemp, 2006; Kemp et al. 2007). These challenges are particularly prevalent in transnational domains which typically lack sovereign rule-makers to steer transition paths and concerted action. We thus seek to investigate: How do multiple governance actors govern sustainability transitions in transnational domains, and thereby convert the elusive notion of sustainability into adoptable practices?

We particularly examine the increasingly important role of *transnational standard-setters* in governance processes in general (Dingwerth and Pattberg, 2009) and sustainability transitions in particular (see e.g. Fuenfschilling and Truffer, 2014). In the absence of overarching authority, multiple, private standard-setters, such as Fairtrade and Rainforest Alliance, take governance roles by translating expectations from the global sustainability discourse and experiences from local producer contexts into adoptable standards of "sustainable practice" across sectors and national boundaries. The coffee sector is a particularly interesting case since it is widely seen as a pioneer sector for the definition of sustainable farming practices in the tropics which other agri-food sectors have emulated over time (Kolk, 2005). Starting from multiple fragmented, often locally bounded, niche innovations in the 1980s and 1990s, the share of sustainably produced coffee (measured by certified or verified coffee volume) has steadily increased globally from less than 1% in 2000 to 16% in 2008 and 40% in 2012 (SSI, 2014).

Our central finding is that standard-setters have promoted and shaped sustainability transition processes through a collectively produced and continuously evolving *modular governance architecture*. *Modular* means that sustainability goals are translated into standards through an evolving set of manageable,

adaptable, quasi-independent governance modules, e.g. 'soil conservation' and 'child labor', along the triple bottom line – economic prosperity, environmental quality, and social equity. *Architecture* means that along with governance modules, standard-setters specify linkages between modules which are weak yet not negligible. Standard-setters thereby repeatedly (1) create *new* governance modules by aggregating findings from local niche experiments into more general rules, also driven by their own interests and agendas; (2) negotiate and adjust the content of governance modules through interchanges with peers and global discourse to legitimate them in transnational transition networks; and (3) re-integrate modules into an emerging architecture by creating multiple interfaces. Through this modular governance architecture, standard-setters have been able to reduce ambiguity around global sustainability goals; account for differences in local practice conditions; and facilitate coordination among multiple standard-setters.

Our findings make two major contributions to the literature on sustainability transitions. *First*, by examining how "sustainable practice" can be promoted across geographic boundaries through a modular governance architecture we contribute to our understanding of transition management (Kemp et al., 2007; Raven et al., 2010). Specifically we show how governance complexity in sustainability transitions can be managed (Shove and Walker, 2007; Voss et al., 2007), how governance structures can be made more 'participatory' (Ferraro et al., 2015), and how the overall collective capacity of governance actors to promote change can be increased (see also Eberlein et al., 2014). Our focus on modular governance processes also specifies a critical mechanism through which the tension between the need for generic and concrete adaptable solutions (Brunsson et al., 2012) can be managed, in particular in transnational domains (see also Grunwald, 2000; Sabel and Zeitlin, 2012). *Second*, we contribute to a more dynamic understanding of meaning-making in sustainability transitions. Whereas prior research has focused on 'meaning-making processes' in local settings (Nicolini, 2011; Schatzki, 1997; Shove and Walker, 2010) and the problem of ambiguity at the global level (Gray, 2010; Voss et al. 2007; Smith and Stirling, 2007), we show how the meaning of sustainability is constituted and shaped at the transnational level, across particular geographic contexts.

Next, we elaborate sustainability transitions as a multi-level governance problem. We then introduce standard-setters as important governance actors in this process. This is followed by an introduction of the global coffee sector. After explaining our data and methods we report our findings on governance activities of transnational standard-setters in coffee. We conclude with implications for research on governance in sustainability transition and point out key implications for policy-makers.

The Challenge of Governing Sustainability Transitions in Transnational Sectors

Many scholars have grappled with the question of how *socio-technical systems* can be made more 'sustainable' (Markard et al., 2012; Geels, 2010; Kemp et al., 2007). Socio-technical systems are typically understood as relatively stable configurations of individual and organizational actors, their relations and practices, and institutions (norms, standards), technologies and knowledge supporting the production of goods and services (Raven et al., 2010; Geels, 2004; Garud and Gehman, 2012; Rip and Kemp, 1998). Socio-technical systems are more or less 'sector-specific', i.e. specific to particular goods and services. In this study we focus on the global coffee sector and its system of production and trade relations and practices. Socio-technical systems are further characterized by certain dominant logics, norms and deep structures called 'regimes' (Geels and Schot, 2007; Geels, 2011), which stabilize systems, but also present a barrier for system-level change (Raven et al., 2010; Fuenfschilling and Truffer, 2014).

Sustainability transitions of socio-technical systems, i.e. changes towards more sustainable modes of production and consumption, are very complex (Markard et al., 2012). They are examples of what Ferraro et al. (2015) refer to as 'grand challenges', i.e. unresolved problems that are complex, uncertain and ambiguous. Several scholars have argued that, similar to socio-technical transitions (Rip and Kemp, 1998; Geels, 2002; Geels and Schot, 2007), sustainability transitions can only happen through complex interactions and co-evolutionary alignments between socio-technical 'landscapes', protected niches, and socio-technical systems (Geels, 2010; Smith et al. 2010; Kemp et al., 2007). We briefly introduce the

interplay of these multi-level dynamics, and then focus on approaches to and challenges of governing sector-wide transitions, especially in transnational domains.

On the one hand, socio-technical systems interact with *socio-technical landscapes*. These are typically understood as exogenous sets of political, economic, social and technological factors affecting both the continuous operation and transformation of established systems (see e.g. Raven et al., 2010). Landscapes are a combination of relatively stable structures, such as global institutions, macro-economic conditions, cultural norms, and technical infrastructures, and more dynamic processes, such as economic shocks, social movements and political discourses (Van Driel and Schot, 2005; Geels and Schot, 2007). We focus in this study in particular on the global sustainability discourse as an important enabler (but also barrier) of sustainability transitions in socio-technical systems.

On the other hand, socio-technical systems interact with *niches* which can be regarded as smaller-scale versions of such systems (Geels and Schot, 2007). They are often seen as 'protected spaces' (Smith and Raven, 2012) or 'incubation rooms' (Schot, 1998) within which radical innovations and changes can be initiated and 'tested' (Raven et al., 2010). From an evolutionary view, niches may create variations which are needed to stimulate system-level changes (Geels, 2002). More specifically, Geels (2002) argues that niche-innovations may build up momentum for system-level change at times when changes at the landscape level also generate pressure and help de-stabilize established norms and practices. Niches may exist in terms of specific (protected) industry or technological domains (Geels, 2002), or as localized settings that are 'protected' from outside competitive and other selection pressures through geographic boundaries (Coenen et al., 2012). We focus in this study on niches in terms of practice experiments in local producer contexts that may inform 'sustainable practice' in a particular sector.

Many scholars further agree that the complex and political nature of 'sustainable development' necessitate some degree of *governance* to effectively promote system change (Smith et al., 2005; Smith and Stirling, 2007; Voss and Bornemann, 2011; Shove and Walker, 2007). Governance in our context consists of two main aspects: First, it concerns the ability of key promoters of sustainability transitions – 'governance actors'

– to organize themselves to 'get things done', despite often diverging interests and distributed access to resources and expertise (see also Jessop, 2002). Governance thus often builds on 'distributed agency', which necessitates a participatory structure; some flexibility in interpreting actions and outcomes; and ongoing, distributed experimentation in local contexts (Ferraro et al., 2015; Sabel and Zeitlin, 2012). Second, and relatedly, governance refers to individual and collective efforts of "organiz[ing] and sustain[ing] attempts to change the behavior of targeted actors to address a collective problem or attain a collective end" (Eberlein et al., 2014). It should thus allow for both "collective action" and "deliberate interventions" in transition processes (Shove and Walker, 2007), including the constitution of a 'transition arena'; the development and articulation of a unifying vision; the mobilization of actors and resources for concrete projects; and continuous evaluation of the undertaking (Voss and Bornemann, 2011; Kemp and Loorbach, 2006; Smith et al., 2005). Some scholars also refer to multi-level 'transition management', which builds on continuous cycles of experimentation and learning, combining long-term planning with incremental change (Kemp et al., 2007; Grunwald, 2000).

Governance processes in sustainability transitions have been examined mostly in terms of policy efforts at the level of repeated niche experiments and, to a lesser extent, at the level of landscape-level policies (Genus and Cole, 2008). On the one hand, scholars have examined so-called 'strategic niche management' (Raven et al., 2010). The idea is to mobilize various stakeholders to create 'artificial niches' where new practices and technologies can be tested and refined, in order to be 'scaled up' later on. For example, Romijn and Caniels (2011) examine the development of 'Jatropha' biofuels production in Tanzania as a niche experiment for promoting alternative energy sources across developing countries. Similarly, several studies have examined how sustainability certifications are tested as 'proto-institutions' at the local level as templates for larger-scale global change (Lawrence et al., 2002; Manning and Von Hagen, 2010). On the other hand, several studies have examined the role of government or inter-governmental policies as a major source of institutional pressure on established system-level practices (Boli and Thomas, 1997; Maguire and

Hardy, 2006; Meyer, 2010), such as the execution of the Waste Electrical and Electronic Equipment (WEEE) directive of the European Union (Lauridsen and Joergensen, 2010).

Yet, our knowledge of how governance efforts can effectively promote system change remains rather limited (Smith et al., 2010; Genus and Coles, 2008; Kivimaa, 2014). Coenen et al. (2012) particularly stress that we need to better understand system-level changes of business practice in *transnational domains*. This is because many sectors span territorial boundaries, linking localized activities with trans-local networks. In such domains, inter-governmental policies and discourses are often very distant from local practice conditions. For example, whereas the discourse around sustainable food production takes place mainly in consumer countries, the implementation of (more) sustainable practice happens (or is designed to happen) primarily in producer countries. We seek to better understand transnational governance of sustainability transitions in sector-wide practices, i.e. regularized and institutionalized modifications of activity patterns of sector participants in line with sustainability objectives.

Analyzing governance processes in sustainability transitions in general and in transnational domains in particular requires to pay attention to three core interrelated obstacles which have been discussed in prior studies (see e.g. Kemp et al., 2007): (1) the ambiguity of the meaning of sustainability as a concept used in global discourse; (2) the diversity of local practice conditions and experiments; and (3) the multitude of governance actors, interests and agendas in the sustainability arena.

First, many scholars have noted that, despite continuous governance efforts, the very concept and goal of 'sustainability' remain highly ambiguous (Gray, 2010; Voss et al. 2007; Shove and Walker, 2007; Smith and Stirling, 2007), i.e. it invites a multitude of parallel interpretations (Weick, 1995). Even though some authors contend that multi-vocality and interpretive flexibility (Pinch and Bijker, 1987) allow heterogeneous actors to participate in addressing large-scale problems (Ferraro et al., 2015), others have emphasized the challenges resulting from goal ambiguity (e.g. Voss and Bornemann, 2011). Lauridsen and Joergensen (2010) find that conflicting interpretations around what the new EU waste policy actually means has created substantial obstacles to effective system change. Interpretations may also shift over time

and remain subject to ongoing political contestation (Voss and Bornemann, 2011; Fourcade, 2011). To illustrate, nuclear power has been treated at certain times as a threat to a sustainable future, and at other times as a sustainable and emission free source of energy (Garud et al., 2010).

Arguably, the problem of ambiguity has increased over time. In the early years of the global discourse, "sustainability" was linked to ecological limits to global economic growth, e.g. by the Club of Rome in 1972. Later, the concept incorporated what is widely known as the 'triple bottom line', which links environmental quality to economic prosperity and social equity (Elkington, 1998). This discursive shift was initiated by the UN Brundtland Commission which argued that "[t]he environment does not exist as a sphere separate from human actions, ambitions, and need" (WCED 1987, p. 13). As a result, "sustainability" has become an umbrella term for formerly separate and partly conflicting objectives, such as environmental protection *and* economic growth. This ambiguity presents a critical burden to coherent collective action. It hampers the development of a unifying vision; the mobilization of actors for joint projects; and a consistent evaluation of sustainability projects (see e.g. Voss and Kemp, 2006).

Second, it remains unclear how governance can help aggregate local niche experiments into more generic lessons and rules (Coenen et al., 2012) so as to inform mainstream practice. Experiments are often idiosyncratic and embedded in specific territorialized settings, which potentially constrain their applicability across contexts. In the transitions literature, this is referred to as the 'upscaling' problem (Raven et al., 2010). Whereas processes of implementing and adapting already established practices in different local contexts are well understood (see e.g. Bechky, 2003; Nicolini, 2011; Perez-Aleman, 2011), the process by which niche experiments may promote sector-level practice is less clear. One key problem is that parallel experiments, while supporting the sustainability agenda, bear the risk of 'disjointed incrementalism' (Lindblom, 1959; Voss et al. 2007). By contrast, more 'directed' incremental change (Grunwald, 2000; Kemp et al., 2007) requires coordination across experiments, continuous learning and a shared agenda between governance actors (Bos et al., 2013).

However, governance is further complicated by a *third* major problem – the multitude and heterogeneity of governance actors, interests and agendas (Kemp et al., 2007). As the global sustainability agenda has expanded and the range of practice experiments has increased, the number of participants in the sustainability arena has risen as well (Kuhlmann, 2012; Shove and Walker, 2007; Voss and Kemp, 2006). Relatedly, the ineffectiveness of intergovernmental regulation in recent decades (Newton, 2002) has invited a wide range of private actors, including NGOs and corporations, to bring in their own interests, resources and agendas into often ongoing processes of negotiating transnational governance instruments (Bartley, 2007; Eberlein et al., 2014). For instance, in coffee, cocoa, textiles, and other sectors multiple social and environmental standard-setters with different goals and agendas have been competing for adopters (Fransen, 2011; Reinecke et al., 2012; SSI, 2014). Whereas some scholars appreciate the participation of various actors as potentially productive (Rasche 2010; Sørensen, 2006), others have noted the increasing complexity of coordinating collective efforts when multiple, often conflicting interests and agendas participate in the process (Banerjee, 2003; Hoffman and Bazerman, 2007; Levy and Lichtenstein, 2011; Newig et al., 2007). This is true not only for governance efforts at the niche level, but, to an even greater extent, when it comes to promoting solutions for sector-wide change.

Promoting Practice Change in Transnational Sectors: The Role of Standard-Setters

To better understand governance processes in sustainability transitions, especially in transnational sectors, we need to pay more attention to governance actors who operate at the "global-local node" of global transition networks (Coenen et al. 2012, p. 976). Given the limited ability of governments to regulate business affairs in transnational domains, non-state actors, including multi-stakeholder initiatives, standard-setters and NGOs, have become important in what Eberlein et al. (2014) call 'transnational business governance' (see also Abbott and Snidal, 2001; Bartley, 2007; Helms et al., 2012; Rasche, 2012). We focus on the governance role of transnational standard-setters in this study.

Standards have become a pervasive part of organizational life (Brunsson et al., 2012). In general, they can be defined as "rule(s) for common and voluntary use, decided by one or several people or organisations" (p. 616). Importantly, standards typically do not just operate within particular local contexts, but embody "conformities across time and space" (Timmermans and Epstein, 2010, p.71). Standards thereby include "codified specifications about components and their relational attributes" (Garud and Kumaraswamy, 1993, p. 353), whereby these specifications may relate to processes or products, technical or non-technical domains (Brunsson et al., 2012). In any case, standards embody "technological, institutional or cultural patterns" (Voß et al., 2006, p. 175) that stabilize, legitimate and 'protect' established practices within sectors (Markard et al., 2012; Garud and Gehman, 2011; Geels and Schot, 2007), but also contribute to sedimenting and institutionalizing new practices and norms (Tolbert and Zucker, 1999). Standards are thus being recognized as important vehicles of change in sustainability transitions (Fuenfschilling and Truffer, 2014). For example, Raven et al. (2010) argue that standardization and codification are critical mechanisms through which niche experiments can be 'scaled up' to the sector level. In our context, we are particularly interested in the emergence of so-called 'sustainability standards', i.e. "voluntary predefined rules, procedures, and methods to systematically assess, measure, audit and/or communicate the social and environmental behavior and/or performance of firms" (Gilbert et al., 2011, p. 24).

Standards are developed by standard-setters who belong to the community of 'rule-making organizations' (Dingwerth and Pattberg, 2009). Examples include the Forest Stewardship Council, Fairtrade, Rainforest Alliances and other standard-setters that we look at in more detail later. Transnational sustainability standard-setters have in common that they (a) operate transnationally, (b) establish fairly precise behavioral prescriptions and link them to measurable indicators and verifiers that can be monitored, (c) set rules that are at least minimally effective, and (d) frame rules in support of social and/or environmental sustainability (Dingwerth and Pattberg, 2009). In addition, the meta-organization ISEAL, which was founded to regulate and 'standardize' sustainability standard-setters (Reinecke et al., 2012), defines those standard-setters as credible that (a) involve multiple stakeholders in standard-setting processes, (b) develop methods for

measuring impact, and (c) include mechanisms to assure compliance through certification and accreditation (Loconto and Fouilleux, 2014; ISEAL, 2010). Standard-setters do not act 'as one unit' but rather as a transnational network of independent, heterogeneous organizations. Agency in promoting sector-wide change is thus distributed rather than centrally coordinated.

In setting 'sustainability standards', transnational standard-setters thus face two key related tensions: between the common objective of 'sustainability' and their individual interests and agendas, and between defining abstract 'global' rules for 'common use' in line with sustainability goals and ensuring the implementation of concrete 'local' practices (Brunsson et al., 2012). For this reason, ISEAL, for example, does not impose a particular operationalization of 'sustainability' on their members, but rather allows them to define their own rules and criteria, as long as they are measurable and certifiable, and multiple stakeholders take part in defining them (Loconto and Fouilleux, 2014). This approach follows the principle of 'experimentalist governance' (Sabel and Zeitlin, 2012) where rather than determining policy goals and methods ex ante, they are instead discovered in the course of problem-solving.

Specifically, Sabel and Zeitlin (2012) propose a flexible, adaptable governance architecture where rather broad (central) framework goals, such as food safety, can be implemented and tested in local practice. Similarly, Ferraro et al. (2015) suggest that tackling grand challenges, such as sustainability transitions, require a 'participatory architecture' that allows 'diverse and heterogeneous actors to interact' and engage in 'distributed experimentation' at the local level. However, we still know very little about how such a participatory governance architecture may emerge and operate, especially in transnational domains. Also, we need to better understand how governance actors with different interests and agendas may effectively participate in such a governance structure. In this study we thus seek to specify how 'participatory architectures' in support of 'experimentalist governance' (Sabel and Zeitlin, 2012) or 'distributed experimentation' (Ferraro et al., 2015) are constituted, by focusing on the work of transnational standard-setters in the coffee sector. We find that one critical mechanism through which standard-setters, with partially diverging agendas, coordinate themselves, and also manage the tension between the need for

generic and concrete adaptable solutions (Brunsson et al., 2012) is *modularity*, i.e. the creation, negotiation and re-integration of semi-independent building blocks of 'sustainable practice' into an emerging 'modular governance architecture'. Importantly, this architecture has enabled ongoing experimentation as well as standardization of 'sustainable practice' *across* local settings. However, there is no 'central architect'; rather, this transnational governance architecture has been the more or less intended outcome of ongoing coordination and negotiation at the modular level. We discuss this process in detail below. First, we introduce the empirical context: global coffee production.

Global Coffee Production and Sustainability Standards

Coffee is the most widely traded agricultural commodity in the world, accounting for exports worth an estimated USD 33.4 billion in 2012 (SSI, 2014). The global coffee sector can be described as a socio-technical system of production, trade and consumption that spans across the world but mainly serves consumers in advanced economies, in particular U.S., Western Europe, and Japan (Perez, 2011). The system is largely controlled by a handful of powerful coffee roasters based in some of the largest markets – U.S. and Western Europe – who buy, process and sell coffee beans from thousands of smallholder and larger-scale producers in South America, Africa and Southeast Asia. Coffee production is very fragmented. 25 million smallholder producers, who are directly dependent on coffee for their livelihoods, produce 80% of the world's coffee. Largest producing countries, in terms of volume, are Brazil, Indonesia, Vietnam and Colombia, combining a market share of around 65% (ICO, 2013).

The global coffee sector is an interesting example of an ongoing 'sustainability transition' – from primarily market and price-driven production and trade in the 1990s to practices that are seen as increasingly socially and environmentally 'sustainable' (Ponte, 2002; Kolk, 2005). The dismantling of the International Coffee Agreement (ICA) in 1989, which used to stabilize coffee prices and demand for coffee beans (Pichop and Kemegue, 2005/6), led to fierce price competition and a rather unsustainable cost-driven market logic resulting in poverty and distress for coffee farmers and communities, but also severe product quality and

supply chain security problems for buyers. Facing fierce price competition, labor and living conditions for farmers deteriorated, including discrimination, low wages and temporary employment. In addition, cost pressure accelerated the conversion of primary forest habitat, loss of biodiversity, soil erosion, agrochemical use, and pollution, resulting in environmental challenges that endanger the health of coffee communities as well as the planet. These consequences along with a decreasing interest of young people in entering coffee farming also put the global coffee business in danger, including lower quality of coffee beans and increasing challenges of serving growing demand for both budget and premium coffee.

In face of these challenges, the coffee sector has become a testing ground for sustainability initiatives and standards (Kolk, 2005; Manning et al., 2012; Ponte, 2002). Although international agreements, such as ICO, still exist, their regulatory power has diminished (Pichop and Kemegue, 2005/6). Instead, voluntary standards, along with certification and accreditation bodies, have become important means of governing the sector and of promoting a transition towards a more sustainable system of coffee production and trade (Kolk, 2005; Reinecke et al., 2012). The effect of standards adoption on farmers has been evidenced in several studies (TCC, 2012). According to an impact study in Colombia (CRECE, 2013), farmers certified by AAA (Nespresso) and Rainforest Alliance have significantly improved their social conditions, including health and safety; economic conditions, including productivity and income; and environmental conditions, including soil and water conservation. Due to higher productivity, better quality control and professional farm management, net income levels are reported to be 46% higher for certified than for non-certified farmers, and 87% of certified farms now run recycling programs compared to 43% of conventional farms (CRECE, 2013).

Given the role of sustainability standards in promoting more sustainable coffee production, it is important to understand how they translated the multi-vocal concept of sustainability into meaningful practices over time. As multi-stakeholder governance initiatives, sustainability standard-setters are not homogenous entities, but are themselves the outcome of conflict and compromise between a variety of interests and agendas with starkly differing degrees of emphasis (Bartley, 2007). Table 1 gives an overview of objectives,

origin and target groups of major sustainability standards in coffee. Initially, *NGO-led initiatives* grew out of multiple, fragmented niche experiments with alternative ways of coffee production and trade. They have played a key role in pressurizing coffee roasters to adopt sustainable sourcing practices. For example, the Organic standard emerged in the 1970s from a coalition of environmental activists concerned with banning the use of pesticides and other chemicals to protect the health of farmers and the environment. The first Fairtrade standard-setter, Max Havelaar (Netherlands), originates in the efforts of indigenous peasant communities in the Mexican state of Oaxaca to get better prices for their coffee crops (Boersma, 2009). This led to the creation of the Fairtrade label in 1989, which signified the payment of a fair price, and more generally the aim of economically empowering small-scale farmers in the Global South. In parallel, a network of conservation groups forming the Sustainable Agriculture Network (SAN) grew out of concerns raised by researchers and environmentalists in the 1980s that the agricultural production model of mono-cultured, sun-grown coffee might lead to the destruction of the world's tropical forests and critical habitat losses. Various research projects on ecosystems in Guatemala, Mexico and Costa Rica led by SAN member organizations concluded that shade-grown coffee promotes the conservation of forest and its biodiversity. SAN members founded the Rainforest Alliance in 1987 and started programs experimenting with better farm management practices and certification as a tool for conserving forest habitats, with the first coffee farm certified in Guatemala in 1996. Similarly, in 1996/7, a group of biologists at the Smithsonian Migratory Bird Institute, Washington, DC, who were concerned with preserving the habitat of birds, found that shade coffee mimics forests. Combining organic and shade-grown practice, they created the "Bird Friendly" certification.

In response, major coffee brands started to adopt NGO standards in early 2000s, but also created their own *corporate standard programs* which have become participants in the standards arena. For example, the Dutch firm Ahold launched Utz Kapeh in 1997 (later UTZ Certified) together with suppliers to expand 'sustainable coffee' to mainstream coffee consumption. Other industry-driven standards include Nespresso AAA Sustainable Quality (2003) and Starbucks C.A.F.E. Practices (2004). In 2004, major coffee roasters,

together with the German Development Agency GTZ (today: GIZ) developed the Common Code for the Coffee Community (4C) to offer a baseline sustainability standard. In 2002, pioneering sustainability standard-setters, including Fairtrade, Rainforest Alliance, Organic and UTZ Certified, founded the ISEAL Alliance – a global membership organization which has since played a critical role in coordinating and aligning activities of standard-setters, thereby contributing to the growth, legitimacy and governance of the sustainability standards movement (Loconto and Fouilleux, 2014).

>>>>>>>>>>>>>>> INSERT TABLE 1 <<<<<<<<<<<<<<<

All major sustainability standards today refer to the *Triple Bottom Line* of sustainability by aligning their offerings with the three pillars environmental quality, social equity and economic prosperity (see in detail below). ISEAL thereby played a major role in promoting mutual observation and learning between standard-setters (Loconto and Fouilleux, 2014). However, despite a tendency towards convergence, standards have maintained their own identity, partly based on their historical roots and strategies of differentiation (Reinecke et al., 2012). As we elaborate in detail below, the very ambiguity and openness of the objective of sustainability have allowed multiple standards to co-exist, but also prevented consolidation. However, quite strikingly, the share of sustainably produced coffee (in terms of coffee volume) has steadily increased in recent years, from less than 1% in 2000 to 16% in 2008 and 40% in 2012 (SSI, 2014). Adoption of sustainability standards is thus becoming a mainstream practice among suppliers, and standard-setters have proven to be important governance actors in driving the sustainability transition in the coffee sector. We now seek to examine in detail what governance processes standard-setters have engaged in to effectively promote and translate the sustainability agenda into practice, despite the governance complexity involved in it.

Data and Methods

We take an embedded case approach combining multiple data sources to address our research question (Yin, 2003). Qualitative case analysis is useful to understand complex processes, such as governance in

sustainability transitions, and to build theory inductively (Langley, 1999; Siggelkow, 2007). We first introduce our data sources and then explain how we analyzed the data.

Data Sources

Our data were drawn from three sources: 64 in-depth interviews with actors involved in the creation of sustainability standards, six months participant observation of a standard-setter, and archival data. This longitudinal study (Pettigrew, 1990) consists of three phases of data collection between 2001 and 2011.

In 2001/2, data collection focused on early experiments of sustainability certification, including pilot projects leading to the Common Code for the Coffee Community (4C). 11 Interviews were conducted with representatives of corporate actors (e.g. Kraft Foods) and the German Agency for Technical Development Cooperation (GTZ, later: GIZ) as an important facilitator in the 4C process. In 2007, a participant observation study of the Fairtrade Labelling Organizations (FLO) was conducted. Fairtrade was chosen as a key standard widely credited to have "impacted other operators and prompted the emergence of other sustainability regimes" (European Commission 2009, p. 4). One author spent about 9 hours per working day over six months to shadow actors in the Standards Unit and collect observations of the standards development process. In addition, 31 interviews with Fairtrade staff members, Fairtrade licensees and external consultants were conducted. Interviews focused on challenges of resolving tensions around partially conflicting sustainable development goals in the process of developing the Fairtrade standard.

In 2010/11, we conducted 22 interviews with the aim to understand the coordination among multiple standard-setters. These included follow-up interviews with previous respondents from Fairtrade and 4C, and also with representatives from Rainforest Alliance, Nespresso, producer organizations, experts and development agencies. Interviews focused on the increasing interaction of standard-setters in making sense of the elusive and complex notion of sustainability. We also participated in four sustainability standards workshops and conferences and had numerous informal conversations with standard-setters and actors from the coffee industry. We continued data collection until we had reached "crystallization" (Janesick, 2000) and gained "an in-depth understanding of the phenomenon in question" (Denzin and Lincoln, 2000). On

average, interviews lasted 1.15 hours. All 64 interviews but three were transcribed verbatim leading to over 620 single-spaced pages of transcriptions.

Interview and observation data were complemented by archival data. We gathered publicly available information from standard-setters, research institutions, coffee roasters, retailers and media websites spanning the period from 2001 to 2011. We reviewed publicly available annual reports, press releases and standards documents. In addition, we gathered data from industry statistics and reports, journal publications and a number of benchmarking studies.

Data Analysis

We imported all data into NVivo to organize and analyze our different sources of data. In an inductive, open-ended iterative process, we travelled back and forth between data, literature and emerging theory (Glaser and Strauss, 1967). Through 'open', 'thematic', and 'theoretical' coding (Strauss and Corbin, 1990) we categorized raw data, linked categories to themes and aggregated them into a theoretical process framework we discuss at the end of the paper.

In a *first* round of exploratory, open coding, we mapped the landscape of multiple sustainability standards and tracked their development over time. We were particularly interested at this point in what major challenges standard-setters have faced in their efforts to meaningfully contribute to promoting sustainable practice, and how they have responded to these challenges. For example, one important guiding question for us was how standard-setters have responded to the growing consensus on the 'triple bottom line' of sustainability and its related consequences, including the growing ambiguity around what sustainability means as well as the growing number of standard-setters, agendas and interests.

We then benchmarked standards in order to identify standard elements which were commonly associated with sustainability, as well as elements which were contested and changed in meaning. For example, all standards have adopted ILO "core labor standards" which we would classify as a governance module most major standards agree upon. To enhance the robustness of our analysis, we triangulated our interview data

with secondary reports and standardsmap.org – a web-tool that allows for comparison of indicators and criteria included in a wide range of standards. This historical and comparative mapping helped us acquire an in-depth understanding of the emerging definition of sustainability and its evolution over time.

Second, through thematic coding we focused on how standard-setters have engaged in governance processes both through internal adjustments and external negotiations. More concretely, we analyzed how standard-setters have 'enacted' emerging themes of the global discourse, local practice conditions and associated problems, and their own interests and agendas vis-à-vis other standard-setters. We then identified various activities standard-setters have engaged in to build and refine their own standard and to relate to and position themselves vis-à-vis other standards.

In a *third* step of theoretical coding, we constructed theoretically informed categories for major types of governance activities of standard-setters through cross-referencing of existing codes and the addition of another layer of theoretically meaningful higher-order codes. This transcended the categorization of observable phenomena to uncover their implicit meanings and underpinning processes (Langley, 1999). We went back to existing literature for constructs that could help us better interpret our data (Walsh and Bartunek, 2011). In particular, we identified a strong resemblance between activities of standard-setters and processes of modularization as described in the literature on organizational design and complexity (Henderson and Clark, 1990; Sanchez and Mahoney, 1996; Zhou, 2013). However, we also identified importance differences. We discuss both similarities and differences further below.

Based on this triangulation between our data and existing theory, we categorized three main processes transnational standard-setters have repeatedly engaged in: (1) creating (new) governance modules through local niche experimentation; (2) negotiating the content of modules with peers to legitimate them across local contexts; and (3) re-integrating modules into an emerging governance architecture. We merged and revised thematic codes until our analysis failed to reveal new relationships or alternative explanations. We also discussed our findings with a sustainability standards expert from an intergovernmental development organization. This helped us confirm and further refine our argument.

Toward a Modular Governance Architecture of Sustainable Practice

We find that, collectively, the heterogeneous and transnational community of standard-setters has helped farmers in diverse geographical contexts implement 'sustainable practices' by translating the ambiguous notion of sustainability into a set of unequivocal and enforceable standard criteria, technical assistance and trainings for farmers. In their role as governance actors, standard-setters not only have the ability to evaluate and probe possibilities of putting sustainability into practice, but also to shape the definition and meaning of the concept of sustainability for the whole sector. Standard-setters thus are in a position to act as "pace setters" who are "pushing the boundaries," as a Fairtrade licensee argued.

To do so, however, standard-setters had to address three central governance problems: 1) making sense of ambiguous and sometimes controversial sustainability objectives; 2) streamlining and abstracting from often idiosyncratic local practice conditions; and 3) dealing with diverse interests and agendas of actors, not least amongst their own, highly diverse stakeholder base. We find that transnational standard-setters have been able to manage these challenges mainly through a *modular governance architecture* they have collectively contributed to over time. Standard-setters have thereby defined, codified and inter-related various governance modules in terms of distinct standard criteria that collectively define the meaning and practice of sustainability. This process has *not* been the result of strategic intent of a central 'architect', but rather an emergent outcome of the distributed activities and interactions of multiple standard-setters. We found this process to be collectively driven, continuous and reciprocal, and informed by particular, often module-centered (rather than overarching) interests of standard-setters in the face of an evolving global discourse, and local practice adoption. Next, we examine three core processes underlying the emergence of the modular governance architecture: experimentation, legitimation and (re-)integration.

(1) Local niche experimentation: Creating new governance modules

One key process through which standard-setters have shaped the meaning of 'sustainable practice' has been distributed experimentation, which has informed the creation of quasi-separable governance modules. By

governance module we mean a bundle of distinct 'sustainable practices' (e.g. promotion of Fairtrade Minimum Price payment or shade-based coffee growing) which are codified in form of standardized requirements listed in a text document commonly referred to as "the standard document." They are accompanied by tangible implementation routines, compliance criteria and auditing protocols. For instance, shade-grown coffee is accompanied by technical assistance, farmers' and workers' training policies, control points and assessment methods. Governance modules thus can, in principle, be pursued relatively independently from each other. Through experience, learning and regular revisions, governance modules become "more specific and more codified over time," as a SAN respondent explained, which is regarded as "part of the natural evolution of our standard." As a result of distributed experiments, governance modules are established which contribute to the overall governance architecture by codifying and formalizing 'sustainable practice' *across* local contexts, and by serving as building blocks that can be potentially adopted by *multiple* standard-setters in different settings.

Historically, most governance modules emerged from often multiple local niche experiments of different standard-setters driven by their particular interests and agendas. In fact, as Fairtrade's "fair price" or Rainforest Alliance's "shade-grown practices" indicate, most standard-setters initially focused on specific and idiosyncratic goals, e.g. establishing a fair price, rather than on standardizing "sustainable practice" as a whole. Often, local niche experiments would add new ideas, themes, but also conflict with established notions of "sustainability". In effect, various groups and organizations developed in parallel a number of separate core practices that only later got integrated into a collectively recognized modular configuration of "sustainable practice". Yet, certain modules still remain specific to certain standard-setters rather than others. For example, given the roots of Fairtrade in the social justice movement, the "Fairtrade Minimum Price" has remained the foundational core governance module, even if Fairtrade has expanded its standard portfolio over time. Similarly, for Rainforest Alliance, whose initial core objective was to protect the rainforest, shade-grown practices, specified as an "overall canopy density on the cultivated land [of] at

least 40%" with diverse trees including a minimum of "12 native species per hectare" (SAN, 2008), have become a critical standard building block.

Importantly, new governance modules are established as participants engage in problem-solving activities in response to particular interests and concerns. The creation of new government modules in response to "new issues that present themselves all the time," generates "incremental change [in a specific standard] over time," as a Rainforest Alliance explained. The example of Nespresso AAA illustrates this point, which describes itself as taking a "dynamic, constantly-evolving approach" (Nespresso, 2015). Nespresso had enjoyed growth rates of 20-30% per annum and regarded managing its growth as a strategic challenge since the brand relied on a secure supply of the highest quality coffee beans for its premium products (Nespresso, 2012). "From all the entire coffee in the world only 10% is high quality coffee, but only 1% of the world's coffee is what they were looking for, that had the aromas they wanted," a Nespresso consultant remembered. To incentivize quality, in 2002-03 Nespresso engaged in a series of cross-sector partnership projects with the Rainforest Alliance to experiment with quality practices at the farm level. This initially involved two coffee suppliers, Ecom and Expocafé, and just 300 farmers in Costa Rica and Columbia. Formalization of the initiative from 2005 onwards led to the creation of the "AAA Sustainable Quality" program ('AA' standing for highest quality coffee, adding a third 'A' for sustainability), which covered 63,000 farmers across eleven countries by 2015. In cooperation with the Rainforest Alliance, Nespresso selected core modules from "the other pillars, so social, economic and environmental issues, but [aimed at] integrating quality" as a distinctive building block. Specialized modules "to promote *high quality coffee*" introduced "best practices" in coffee cultivation for shade trees, fertilization, integrated pest management as well as tasting kits to help producers evaluate quality of their coffee.

The creation of additional modules to encourage *productivity* further indicate the role of experimentation and problem-solving activities. Nespresso recognized that securing supply of high quality Arabica coffee was a global bottleneck stifling the growth of the brand. "They looked at the statistics and realized that they were going to run out of that coffee, because demand is higher than supply," a Nespresso consultant

explained. From 2008 to 2010, Nespresso conducted a study of more than 600 supplier farms in Costa Rica, Guatemala, Colombia, Brazil, and Mexico, to better understand the challenges of securing high-quality coffee production. Similar to the early Fairtrade pioneers, Nespresso identified lack of income as a key problem facing coffee communities, threatening the economic sustainability of coffee farming. Researchers concluded that "farmers are generally unprofitable" (Nespresso, 2012, p. 8). An additional problem was the ageing population of coffee growers as the younger generations migrated to the cities for better economic opportunities. Nespresso (2012, p. 8) warned that it "could reasonably expect large-scale exit of coffee producers from coffee-producing zones they depend on for their highest quality coffees."

While "in the beginning it was about quality", the threat to future coffee production made the brand take economic sustainability more seriously. In particular, research alerted Nespresso to increase productivity and producer revenue. A consultant who had worked on elaborating Nespresso AAA explains:

> Nespresso did a lot of research with INCAE [Latin American business school] and what they found out, and this is really radical and controversial, is what drives net income is NOT price. It is actually productivity and quality. Getting higher pay doesn't mean you are getting a higher income […] So farmers should not be thinking about the premium, but about the bottom line!

The study concluded that rather than price, it was "yield", the amount of coffee produced per hectare, and especially the percentage of high quality coffee, that drove producer income. The findings of this research project led Nespresso to develop a concept called Real Farmer Income™ where "the main benefit is based on productivity improvements" to increase incomes. Real Farmer Income™ got associated with a set of governance modules designed to build closer relationships with farmers and tie their benefits to quality and productivity improvements. For example, one productivity module that was introduced as part of the standard package was the systematic rejuvenation of coffee trees, needed because "many farmers have coffee trees that are 20 years old and are not very productive," a respondent explained.

(2) Legitimation across local contexts: Negotiating the importance and content of modules

The ambiguity of sustainability as a concept continues to allow competing definitions of sustainability to co-exist and compete; and distributed paths of experimentation have generated multiple solutions that vie for adopters. As standard-setters filled the meaning of sustainability goals over time with concrete, certifiable rules and criteria, driven by their interests and local practice experimentation, this produced a range of governance modules whose sector-wide adoption partly depends on the degree to which they are seen as legitimate within the trans-local community of standard-setters and adopters. Highly legitimate modules are likely to be adopted by most standard-setters, whereas more controversial modules are offered by sub-groups of standard-setters. We also found that standard-setters would converge on the importance of certain modules *in principle*, yet diverge on their concrete interpretation. Table 2 depicts governance modules that have become accepted as legitimate 'core' elements of sustainability, as well as those that remain more or less contested. Below we describe how legitimation processes are contingent on the recognition of a matching critical issue in the global discourse and negotiation among peers, which can build consensus on the legitimacy of specific governance modules.

>>>>>>>>>>>>>>>>>> INSERT TABLE 2 <<<<<<<<<<<<<<

Reference points in the global discourse. One driver of legitimation across local contexts is the emergence of "obligatory passage points," that is, global institutions that have created key reference points in the global sustainability discourse. The notion of "obligatory passage point" refers to the intersection of meanings and relations among actors in creating a common frame of reference in a particular field (Latour, 1987; Callon 1986). To be legitimate, sustainability standards need to cover these (Dingwerth and Pattberg, 2009). To illustrate, ILO conventions that are designated as "core labor standards" have become an obligatory passage point for the social pillar, promoting ethical norms of universal value across the world. Standard-setters have adopted and explicitly reference ILO conventions to legitimize their aspirations to set standards. For example, both 4C, UTZ Certified (2010) and SAN/Rainforest Alliance (2011) confirm that the formulation of social criteria on labor rights are "based on the international ILO conventions." Similarly, the consensus on "prohibited pesticides lists" shows how global discourse has shaped such agreements. Initially only the

organic standard specifically aimed at eliminating pesticides. But with the Stockholm Convention on Persistent Organic Pollutants (POPs) taking effect in 2004, a global treaty requiring parties to take measures to eliminate or reduce the release of POPs into the environment, eliminating pesticides has become a priority and standard-setters have added "forbidden pesticides lists" to their environmental modules. Such high-consensus governance modules solidify over time and thus become 'standard elements of standards'. However, they are not imposed by any external party – neither by UN organizations nor by ISEAL or other associations. As mentioned earlier, ISEAL does not prescribe to its members what 'sustainability' means. Rather, certain standard elements, such as ILO 'core labor standards' get collectively enacted by standard-setters as a means to gain legitimacy among stakeholders. Notably, ILO conventions existed long before they were 'adopted' by sustainability standards. Only more recently, they got incorporated *as* part of 'sustainable practice'.

To remain legitimate, standard-setters also absorb shifts in the global discourse. For instance, changing consumer preferences have led Fairtrade, initially focused on trade justice, to add modules addressing environmental issues. A Fairtrade respondent reported that the fact that "there is now more concern about the environment and global warming…has been translated into our standards." The way in which standard-setters have responded to the global discourse of climate change by developing climate change mitigation modules illustrates how global discourse and peer pressure stimulate standard-setting activities. Fairtrade (2015) has developed a Fairtrade Carbon Credits module as an "add on" to the existing standard. Similarly, Rainforest Alliance reported that "the Sustainable Agriculture Network has developed a climate change module, a voluntary module. This probably has to be more formalized into the standard when they do the next round of changes in about three years time [due to be published in 2016]."

Negotiating the content of modules – the example of economic benefits. Some modules continue to be controversial, even if there is consensus on their importance in principle. We illustrate that with the concrete specification of 'economic benefits' for farmers by Fairtrade and Nespresso. As a pioneer standard, Fairtrade had claimed moral authority over defining economic benefit as the payment of a "fair" price.

Fairtrade thus pioneered a "fair price" module in 1989 to empower small-holder farmers in addition to pre-financing, long-term contracts and a developmental premium (US$ 1,40/lb + US$ 0,2/lb for washed Arabica since 2011). Other standards have disputed the political rationale – trade justice – behind Fairtrade's 'fair price', while retaining the idea that farmers should benefit economically. For example, despite paying a price premium of 10% - 15% above the market price for high quality coffees, Nespresso was reluctant to adopt the Fairtrade standard. Nespresso lamented that Fairtrade "didn't have a good association with quality […] people bought it for charitable reasons," as a Nespresso consultant explained.

However, in response to Fairtrade and in an attempt to gain further legitimacy as sustainability standards, industry-driven standards soon developed their own income modules. For example, Nespresso's in-house module "Real Farmers' Income" sounded similar to Fairtrade's fair price and shared the same aim of benefitting farmers, yet used a fundamentally different approach. Instead of guaranteeing price premiums (a duty of the buyer), this module promoted higher productivity and better quality (a duty of the producer). This re-interpretations of the meaning of economic sustainability was more driven by standard-setters as self-named representatives of producers than producers themselves. "What they [farmers] are interested in is the premium," as a Nespresso researcher admitted.

The focus on quality and productivity improvements chimed well with mainstream Western buyers, who had long since questioned Fairtrade for subsidizing "inefficient farmers who produce poor quality goods" (Sidwell, 2008, p. 13). It also aligned better with the interests of other standard-setters, who maintained that prices should be "freely negotiated between the individual buyer and seller" (4C, 2010) yet often faced a legitimacy deficit vis-à-vis Fairtrade for not addressing "the unfairness of global markets" and price volatility. With the exception of Fairtrade, standard-setters collectively converged on the idea that farmers' lack of productivity was the key economic challenge, as a respondent from SAN/Rainforest Alliance confirmed: "One of the main problems is that there are extremely unproductive people, I mean, really!" Another SAN/Rainforest Alliance added:

> Everybody talks about 'what is the premium'? I think this is a misleading discussion. Of course our certified coffee is sold at a premium, but we don't think this is the most important thing. The most important thing for the farmer is that the farmer improves practices, and becomes more professional, and also more productive […] But this is something that insiders understand, but the public doesn't understand.

While "productivity and quality are not yet part of our standards," Rainforest Alliance confirmed that "we are working towards that on a project basis, to elaborate a new module to codify what people need to do to produce good coffee, like pruning and rejuvenation of the coffee plants, all these agronomic practices."

With this shift towards quality and productivity as part of economic sustainability, Fairtrade came under increasing pressure to also address productivity. Most respondents regarded the Fairtrade Minimum Price as the defining module that the organization "won't give up on," as Fairtrade's CEO insisted. Fairtrade resisted reducing the association of the economic pillar with higher price – not least to protect its own identity and the label's unique selling point. A focus on productivity conflicted with the initially envisioned power shift from Northern buyers to Southern producers. A respondent from Cafedirect, a Fairtrade coffee roaster, lamented that productivity did not contribute "to have a power shift, right? To shift more value down the value chain to producers and distribute risk more equally than is currently the case in the conventional market." Fairtrade respondents agreed that "efficiency could be contrary to sustainability. I find it risky to over-emphasize efficiency as part of sustainability." But under increasing pressure from buyers to justify premium price payments, Fairtrade (2011) started to earmark 25% of social premium for investments in productivity and quality, acknowledging that "improving productivity and quality is key to increase producers' income and ensure the supply of high quality coffee in the long term."

This partial re-definition of "economic benefits" as productivity rather than fair prices illustrates how a negotiation arena gets defined over time through interactions among standard-setters at the modular level. It helps standard-setters reach agreements on general objectives, while leaving scope for divergent interpretations that accommodate the specific interests of individual standard-setters, quite independent of the interests and needs of producers.

(3) (Re-)Integrating modules into an emerging governance architecture

Whereas initially, various objectives, such as the omission of pesticides (organic), fair prices (Fairtrade), shade farming (Rainforest Alliance) or quality (Nespresso) were promoted rather independently, they have become modular building blocks within an emerging transnational governance architecture promoting the pursuit of a unifying goal – "sustainable practice". Standard-setters have thereby begun to regard each other as participants in a joint transnational arena, characterized by similar objectives. Below we describe how such (re-) integration processes, in particular the ordering of modules along the triple bottom line and the grouping of modules as basic and advanced, have helped coordination among standard-setters. They also helped uncover interdependencies between modules whose recognition has led to greater reflexivity among standard-setters about the contribution of modules to overall sustainability objectives.

Ordering governance modules along the triple bottom line. A key driver for re-integration of governance modules into a coherent meaning system was the notion of the "triple bottom line" that conceptually linked the three pillars of sustainability, which was introduced by the 1987 Brundtland report "Our Common Future" and has increasingly been promoted by the global policy discourse. Importantly, the triple bottom line has not clarified what sustainability 'is'. Rather, it has served as a 'grouping device' for standard-setters, as a symbolic orientation for mutual observation and comparison. Evidence of the adoption of the triple bottom line can be found in the layout of standard documents, where criteria are organized under headings of the social, economic and environmental pillar. Moreover, criteria related to *each* of the pillars are typically treated as separate work packages.

As standard-setters became confronted with each other in a growing market for sustainable coffee, they started to compare each other using the triple bottom line as a benchmarking device. This helped standard-setters categorize their own governance modules into the three pillars of social equity, environmental quality and economic prosperity, but also identify "gaps" which might call into question their legitimacy as a sustainability standard. Fairtrade thus added and refined environmental modules while Rainforest Alliance and Organic added social ones. Over time sophisticated benchmarking tools assisted comparison

between standards. For instance, Fairtrade started to develop internal benchmarking tools in 2007 and refined them in 2008/09 to better understand and track differences and similarities with other standards. Since the late 2000s, a range of benchmarking studies and tools emerged to help consumers and potential adopters navigate through the "jungle" of standards. For instance, the International Trade Centre has developed a web tool allowing users to identify and review different supply chain standards and compare their social, environmental, economic and quality requirements (see http://www.standardsmap.org/).

While the ISEAL Alliance has played a critical role in aligning its members under a common umbrella, the notion of the triple bottom line has provided the common language needed to align formerly disconnected goals. Rather than being only "fair" or "green", settling on a common way of clustering governance modules encouraged standard-setters to see each other as pursuing a shared goal: "At the end of the day, you are talking about the same problems that we are trying to solve in different ways to different extents […] Soil erosion, whatever program you are talking about, the problem is the same" (Rainforest Alliance).

Grouping governance modules as 'basic' and 'advanced'. Competing standards faced increasing criticism for lack of coherence and exploding costs for producers, who often had to adopt more than one standard and pay for multiple certifications to sell their coffee to different buyers. To tackle this issue, we found that in particular second-generation standards played a critical role in promoting step-by-step adoption of sustainable practice by differentiating 'basic' modules, which can be implemented upfront, and 'advanced', more flexible modules, which follow later. 4C illustrates this process. Sponsored by mainstream coffee roasters, 4C wanted to develop an entry-level baseline standard by 'eliminating worst practices' rather than innovate new modules. To identify the most basic components of sustainability, 4C's initiating stakeholders engaged in a search process along the triple bottom line whereby they assessed which modules should be considered 'baseline.' A 4C representative remembered how they compared "the standards of Fairtrade, organic, UTZ Certified, SAN/Rainforest Alliance, Starbucks' C.A.F.E. Practices […] and sorted them according to economic, social and environmental dimensions […]. And then our stakeholders discussed what we considered as really unacceptable practices that should be excluded in 4C." Under pressure from

ISEAL to demonstrate added value as a new standard, 4C established a 'baseline' configuration of modules which could be recombined with modules from other standards. 4C collaborated with Fairtrade, UTZ Certified and the Rainforest Alliance to create an entry level package that provided a step-up approach to compliance towards more demanding standards. According to the same principle, many standards today group their own offerings into basic and advanced modules to, on the one hand, facilitate adoption by farmers with a different degree of readiness or preparation for certification, and, on the other hand, stimulate endorsements from other standards, which further drives down certification costs. One good example is the collaboration between Nespresso AAA and Rainforest Alliance (CRECE, 2013).

Reflecting on interdependencies between governance modules. Converting the notion of sustainability into a rather loose set of governance modules along the triple bottom line has allowed standard-setters to negotiate concrete sustainable practices independently of each other without having to operationalize the overarching goal of "sustainability". Yet, on the ground, governance modules are highly interdependent. Our data suggests that such sometimes unforeseen interdependencies are typically discovered when modules are enacted in local settings. These observations have been an important driver of learning and reflexivity of the emerging modular architecture of sustainability in practice.

One example is the relationship between environmental and economic benefits of shade-grown coffee, one of Rainforest Alliance's core modules. A SAN/Rainforest Alliance respondent explained how shade-grown coffee may also increase quality and crop resilience while reducing costs, thus raising incomes:

> Putting in shade is something that can be done. It is not the most difficult, not even the most expensive change. Sometimes mentally it is a big change for the farmers, because they fear that their productivity will go down, which is probably true. But then we argue that their quality often will go up, and their needs for agrochemical products will go down, so they will have a cheaper production system. They will also have a risk of fewer diseases because you go from a monoculture to a more diversified agro-forestry production system which is more robust and resilient, which is not a big risk to get all sorts of diseases as in a mono-culture, plus reduce the risk of soil erosion, which will raise their productivity in the long run.

However, these interdependencies have to be carefully calibrated. A respondent from Rainforest Alliance explained how this may lead to trade-offs, depending on context-specific factors, such as local climate and vegetation:

> You might have farmers in Peru who basically grow coffee right there in the forest, and they might have 70% shade. […] So that means they hardly produce any coffee, so they are poor, and they have the incentive to expand their coffee growing area. […] and sometimes the right approach is actually to chop down some of your shade if you can give the man a good productivity in return.

Hence, conservation efforts may be at odds with objectives of productivity gains and higher yields needed to ensure effective land use. The need to strike a careful balance between productivity and ecological quality was an insight that arose from knowing the conditions on the ground, rather than from the global discourse, as a Rainforest Alliance informant explained:

> I worked in UN Development Programme – and many of my former colleagues would say 'how can you suggest them to chop down the shade?' But you need to make it possible and even attractive to be a coffee farmer. Even for the next generation. Nowadays people don't want to be farmers. The young generation is moving to the cities. And I think fundamentalists they miss that, they don't capture that […] these are complicated issues that are difficult to put in a slogan.

Productivity improvements themselves could be seen as a critical conservation strategy, as a SAN/Rainforest Alliance respondent explained:

> We as a conservation organization we are very cognizant of the risk if people don't use the land that they have in a sustainable way and really maximize the use of it, then we will run out of land. And where will they take the land from? So this will clearly come from the remaining rainforested areas, and we lose the remaining natural areas that we have on earth.

To address these tensions and the complexities arising from interdependencies between modules as they get implemented in practice, standards have begun to add flexibility to the implementation of modules without giving up on the importance of 'having each module' as part of a coherent system. SAN/Rainforest Alliance, for example, modified its 'shade growing' criteria. In the old standard, one requirement was to preserve at least 12 native tree species and at least 70 trees per hectare; now it changed to an average of 12 native tree species, with no minimum number of trees per hectare. Also, previous criteria stated a minimum

of 40% shade cover, now the standard specifies this minimum only on cultivated land. This shows how governance modules get adjusted as they are incorporated into a dynamically changing modular architecture. A Rainforest Alliance representative explains: Land use "needs to be as effective as possible, but in a sustainable way…and I think fundamentalists miss that, they don't capture that complexity."

Discussion: Governing Sustainability Transitions Through a Modular Architecture

Above we examined how transnational standard-setters have defined and promoted 'sustainable practice' across the global coffee sector by collectively building a modular governance architecture. Modularity enables cumulative standardization and implementation of 'sustainable practice' across local contexts, while providing space for the negotiation and addition of new building blocks. This architecture is composed of an evolving set of quasi-independent governance modules, e.g. 'banning of pesticides', 'shade-growing' and 'producer income', and interfaces between modules, e.g. distinctions and interrelations between 'basic' and 'advanced' modules. Through this modular architecture, which continues to evolve, and the ongoing creation and negotiation of governance modules, standard-setters have collectively managed to lower the ambiguity of the ongoing global sustainability discourse; increase the utility of local niche experiments and experiences; and facilitate coordination among multiple actors with partly conflicting interests and agendas. Our notion of a modular governance architecture specifies the emergence and utility of an important structural dimension – modularity – as part of 'participatory architectures' (Ferraro et al., 2015) that allow diverse and heterogeneous actors within global transition networks to interact constructively. This facilitates 'experimentalist governance' (Sabel and Zeitlin, 2012) in sustainability transitions, in particular in transnational domains, like the global coffee sector.

>>>>>>>>>>>>>>> INSERT FIGURE 1 <<<<<<<<<<<<

Based on our empirical findings, Figure 1 displays key processes in which transnational standard-setters engage. In combination, they have contributed to the emergence of a modular governance architecture: creating new governance modules (experimentation); negotiating the content of modules with peers

(legitimation); and creating modular interfaces within an emerging governance architecture (re-integration). These processes happen at the global-local intersection of socio-technical transitions (Geels, 2004; Coenen et al., 2012) as they are informed by both global discourse, policies and transnational communities, and local producer contexts. They are also driven by the particular agendas of standard-setters which are both enabled and constrained by the global discourse: they are enabled by the multi-vocality of sustainability as a concept and the proliferation of private governance initiatives (Eberlein et al., 2014), and they are constrained by the need of standard-setters to legitimize their role as governance actors and rule-making organizations (Dingwerth and Pattberg, 2009). Importantly, while standard-setters engage in these processes quite intentionally and strategically, in support of their own agendas, the resulting governance architecture is a collective, rather unintentional, outcome of reciprocal interactions rather than the product of a 'central architect' (see also below). Next, we discuss the process in greater detail.

First, standard-setters have been engaged in niche experimentation with sustainable practices in local production contexts that has led to the *creation of new governance modules*, e.g. fair prices, elimination of pesticides, shade growing practices – initially to pursue their own objectives, and later to complement other modules. A governance module is defined by a 'sustainability'-related objective, pursued rather independently through concrete sets of techniques and processes which can be certified, monitored and evaluated. The creation of a (new) module is a result of the interplay of aggregate findings from local experiments (e.g. the need to enhance farmers' productivity) and specific agendas of standard-setters (e.g. industry's interest in securing long terms supply of quality coffee). They are also informed by frames in the global discourse (e.g. the now widely accepted notion of 'economic sustainability').

Second, standard-setters have been engaged in legitimation processes by *negotiating the content of modules with peers* across local contexts through matching criteria in the global discourse. Whereas diversity encourages parallel experimentation (Coenen et al., 2012), it poses a challenge to coherence of practices across the sector. Negotiations between standard-setters, e.g. about the meaning of 'producer benefits', often result in agreements on the importance of modules *in principle* while leaving room for variations in

how the actual content of modules is formulated and implemented by standard-setters. The modular approach allows for such flexibility, whereby 'flexibility' is also constrained by boundaries of legitimacy. Such boundaries are also set by global policies and discourses producing norms and prescriptions of 'sustainable' practice (e.g. consensus on the need to abolish the worst pesticides). Certain modules thus become institutionalized *in principle* across standard-setters as critical sustainability elements, while negotiations of specifications of modules are ongoing – guided by interests and agendas of standard-setters, changes in the global discourse and experiences on the ground . Importantly, over time, standard modules become more than just 'individual' offerings of standard-setters, without necessarily being 100% harmonized across standards in all their specifications.

Third, standard-setters have been engaged in *(re-) integrating governance modules into an emerging architecture* that reflects the overarching objective of sustainability transition. This process is informed by institutional expectations from the global governance discourse (Eberlein et al., 2014; Dingwerth and Pattberg, 2009) and meta-organizations such as ISEAL (Loconto and Foullieux, 2014). Certain themes from the global discourse, such as the triple bottom line, have thereby served as templates to guide this integration process. Integration happens through the creation of multiple interfaces: First, standard-setters categorize modules as part of one of the three pillars – economic, environmental and social – and thereby legitimize their contribution to the overarching goal of sustainability. Second, through negotiation processes, modules get categorized over time as 'basic' or 'advanced', which helps solidify 'standard elements of standards' in a cumulative way and which stimulates endorsements of offerings across standards, such as Rainforest Alliances and Nespresso AAA. Based on this ordering principle, which is also informed by implementation challenges in practice as well as pressures to lower certification costs for farmers, 'advanced' modules can (or should) only be implemented once 'basic' modules are in place. Third, reintegration involves the continuous evaluation of potential interdependencies of different governance modules on the ground, e.g. implementing shade-grown practices and promoting productivity. This has led to increasing reflexivity as to the contribution of particular modules to the overarching goal of greater sustainability.

The emerging modular governance architecture has helped standard-setters manage the complexity arising from the ambiguity of sustainability objectives, the idiosyncrasy of niche experiments, and the multiplicity of governance actors. To some extent, the modular governance architecture we observe in the global coffee sector resembles modular designs of complex products and systems that have been studied previously (Henderson and Clark, 1990; Garud and Kumaraswamy, 1995; Sanchez, 1995; Sanchez and Mahoney, 1996). In these contexts, modularity describes the degree to which interfaces between system components are specified in such a way that they can be operated with minimized coordination, thus mitigating complexity (Baldwin and Clark, 2000; Baldwin, 2008; Ethiraj and Levinthal, 2004). The principle of modularity has also been applied to conceptualize division of labor and parallel distributed work and innovation within open collaborative systems (Baldwin and Hippel 2011; Fjeldstad et al., 2012). Similarly, modularity allows multiple standard-setters with different agendas to contribute to sustainability transitions as a complex and collective undertaking.

However, the modular *governance* architecture we observe here also differs from previous accounts of 'modular architectures' in two major ways. *First*, whereas the previously studied modular architectures are typically 'designed' to be modular, i.e. products, firms and collaborative systems are intentionally modularized to facilitate innovation and improvement (see e.g. Henderson and Clark, 1990; Baldwin and Hippel, 2011), there is typically no 'central architect' in the context of transnational sustainability transitions. In fact, one key challenge has been distributed governance over a multiplicity of actors – here: standard-setters – with partly conflicting goals and interests. We showed that individual standard-setters started out with specifying their own offerings before gradually entering mutual observation, imitation and negotiation that would eventually promote an emerging modular governance architecture. The growing consensus on the triple bottom line of sustainability was an important 'event' in the global discourse that stimulated standard-setters to align distinct building blocks within a common architecture. Yet, it is an open question whether such an architecture will be promoted more proactively in other sectors.

Second, and relatedly, whereas in technology development, particular modules are typically derived from decomposing established processes and systems (Sinha and Van de Ven, 2005; Zhou, 2013), in our case, such a 'system' did not exist in the first place. Instead, standard-setters have engaged in 'adding' new modules to an evolving sustainability agenda, whose interfaces with other – existing – modules are negotiated over time. Thus, 'system (re-) integration' is not about specifying all interfaces between modules (Baldwin and Clark, 2000; Baldwin, 2008; Ethiraj and Levinthal, 2004), but about gradually promoting 'systemness' (Giddens, 1979) through step-by-step definition of interfaces and interrelations between modules. This way, the overall governance process has been rather flexible and adaptable, accounting for continuous learning from local experimentation, and an evolving global sustainability discourse. This reflects the fact that, compared to technological transitions (Geels, 2002), sustainability transitions are much more political, intangible and open to re-interpretation (Shove and Walker, 2007). However, we also observed processes of solidifying modules as 'basic building blocks' which, in combination, constitute a rather stable 'platform' based on which standard-setters continue to add new modules. This relates to the fact that sustainability standards are also linked to technologies in a broader sense, e.g. particular farming practices and quality control tools, whose implementation can be rather path-dependent as it lowers the cost of adding compatible modules, while making it costly to switch to entirely different systems (Brunsson et al., 2012; Garud and Kumaraswamy, 1993).

Implications

Our findings make two major contributions to the literature. They help (1) elaborate modularity as a mechanism of managing sector-wide sustainability transitions, in particular in transnational domains; and (2) point to dynamics of meaning-making in sustainability transition processes.

First, we contribute to our understanding of transitions management (Kemp et al., 2007; Raven et al., 2010), by showing how modularity can help mitigate key challenges in sustainability transitions (Shove and Walker, 2007; Voss et al., 2007). To begin with, modular governance is a critical mechanism through which

the tension between the need for both *generic* and *concrete* adaptable solutions (Brunsson et al., 2012) can be managed, in particular in transnational domains (see also Grunwald, 2000). We thus see modularity as an important facilitator of what Sabel and Zeitlin (2012) call 'experimentalist governance', which becomes particularly relevant in tackling complex – highly interdependent, uncertain and ambiguous – challenges, such as sustainability (Ferraro et al., 2015). While the role of modularity in managing complexity has been examined mostly in technological innovation (Henderson and Clark, 1990; Ethiraj and Levinthal, 2004; Baldwin and Hippel 2011; Fjeldstad et al., 2012) and technological transitions (e.g. Gawer, 2014), we show that modularity can also be a "rich entry point into a broader set of issues cutting across technological organizational and strategic domains" (Garud et al., 2009, p. 7). But in contrast to technological systems, the modular architecture we observe seems more open, flexible and emergent. Governance architectures seem to be systems 'in-the-making' – similar to infrastructures, which are "fundamentally relational" (Star 1999, p. 80) and provide interfaces for extensions and refinements. They might never be 'complete', but they adapt to changing agendas and experiences (see also Kemp et al., 2007). This also reflects more recent notions of 'governance' in sustainability transitions as continual and ongoing "systems of practice" – "the emergent outcome […] of interacting and co-evolving practices [rather] than […] the knowable products of policy intervention" (Shove and Walker, 2010, p. 472). In fact, "effective intervention may lie in the generation and circulation of elements of which variously sustainable practices are made" (p. 472). Modular governance architectures account for this need of continuous adaptation of sustainable practice.

Moreover, the benefit of a modular governance architecture goes beyond promoting adaptability of 'sustainable practice' across time and space. It also reduces ambiguity around the goal of sustainability and helps mitigate conflicting interests among governance actors – a particular problem in sustainability transitions whose objectives are less tangible than technological transitions. For example, while participants are unlikely to agree on *all* dimensions of sustainability, they are likely to agree on *some*. Modular governance approaches help develop and sustain "provisional settlement" (Girard and Stark 2002, p. 153) or a "working consensus" on which modules are important. Thereby, modular governance processes in

support of rather intangible, yet often highly controversial objectives, such as sustainability, are less constrained by concerns for 'compatibility' and 'efficiency' between/across modules than for example technological standards, systems, and infrastructures. Our findings suggest that emerging governance architectures are much more a product of ongoing political negotiations and agenda-setting. Relatedly, governance modules as part of a modular governance architecture may vary in the degree to which they are specified as well as in the range of co-existing alternative specifications, reflecting different, sometimes conflicting interests of governance actors. Yet, even if modules vary in specification, the overall modular approach can lower the potential risk of stagnation in sustainability transitions due to goal ambiguity or conflicting interests (Banerjee, 2003; Hoffman and Bazerman, 2007; Levy and Lichtenstein, 2011; Newig et al., 2007). For example, under the umbrella of climate change, various carbon offset initiatives have emerged and now co-exist (Hoffman, 2011). They allow the implementation of climate-friendly practices by various actors who have reached settlement on the meaningfulness of carbon offset programs, and thus also support a growing consensus around climate change as an 'issue'. Thus, modular governance architectures can help channel governance processes often over longer periods of time, such that consensual goals can be pursued while controversial ones are delayed or re-framed.

Our findings also help elaborate the role and implications of distributed agency in sustainability transitions (Shove and Walker, 2007; Rip, 2006), focusing on interactions amongst multiple standard-setters as governance actors. Here, the agency to implement policy and governance objectives is distributed across decentralized – both competing and collaborating – actors (Sørensen 2006, Rasche 2010). More than previous studies on transitions management (e.g. Kemp et al., 2007; Raven et al., 2010), we discuss the operational challenges arising from distributed agency and control over the process. We show that standard-setters are neither merely 'agents of change' on behalf of others, e.g. policy-makers (Kivimaa, 2014), nor do they simply pursue 'their' own interest and agendas in sustainability transition processes (Newig et al., 2007; Shove and Walker, 2007; Voss et al., 2007). Rather, our findings suggest how governance processes of standard-setters are influenced by global discourse dynamics, recurrent local experimentation, and the

standard-setters' own specific interests and agendas vis-à-vis their peers. Increasing interaction of standard-setters, partly promoted by the meta-organization ISEAL (Loconto and Fouilleux, 2014), has stimulated a modular governance process that has enabled coordination and mutual endorsements, and allowed adjustments of standards elements to a variety of local practice conditions. Arguably, the emerging modular structure is participatory in that it enables governance architectures to accommodate for multiple and changing participants (Ferraro et al., 2015), and enables these divergent actors to cooperatively govern sustainability transitions in the absence of an overarching authority. This process thereby increases the collective governance capacity of standard-setters, including their capacity to learn (see also Bos et al., 2013) and upscale solutions from local experiments (Raven et al., 2010), as well as their ability to combine long-term strategic orientation with pragmatic incremental change (Kemp et al., 2007).

In this regard, a modular governance approach may also promote *reflexivity in sustainability transitions*, in terms of the ability to monitor and evaluate consequences of action and incorporate learning processes into future interventions (Voss et al., 2007; Shove and Walker, 2007; Smith and Stirling, 2007). Prior research has indicated the importance of continuous learning, to promote upscaling and to lower the risk of 'disjointed incrementalism' (Lindblom, 1959). Yet, at what *level* reflexivity can be realistically promoted has been less clear, in particular since the capacity of governance actors to be mindful of their actions is limited (Rip, 2006; Giddens, 1984). We suggest that, while 'local learning' is still important (see Bos et al., 2013; Perez-Aleman, 2011), reflexivity at the transnational sector level is as critical. However, we show that reflexivity, e.g. related to the consequences of shade-grown or the antecedents of farmers' benefits, seems to be promoted mainly through 'modular learning processes', which includes learning about the functioning of a module in practice as well as the importance of interfaces between modules, e.g. shade-grown (environmental pillar) and productivity (economic pillars).

Second, our study contributes to our understanding of *meaning-making in sustainability transitions*. In particular, we are able to shift emphasis from a prior focus on meaning-making in local contexts of practice implementation (Shove and Walker, 2010; Perez-Aleman, 2011) to neglected processes of meaning-making

across local contexts within trans-local transition networks. Our findings help understand how multi-vocal meta-concepts (Ansell, 2011), such as 'sustainability', gain meaning 'in use' by being enacted and embedded in social practice (see in general, Wittgenstein, 1997; Schatzki, 1997), by showing how local lessons are aggregated into more generic and transferrable 'governance modules' which are constituted and negotiated beyond particular, territorialized implementation contexts. Unlike locally embedded practice, governance modules and the meaning they embody are in a state of continuous translation, informed by intermediaries who "reflect in action" (Yanow and Tsoukas, 2009). Meanings thereby emerge 'collaboratively' (Tsoukas, 2009) across contexts, whereby heterogeneous actors maintain a going concern around overarching goals. As a result, the very meaning of sustainability keeps evolving – not only at the level of global discourse, but the increasingly important sector level. Meaning thereby gets constructed in a modular, rather than holistic fashion, as multiple actors negotiate the content of governance modules. This has important implications for other concepts of transnational governance, such as diversity, poverty alleviation, gender equity etc. Future research thus needs to further investigate meaning-making processes in various, more or less interrelated transnational domains over time.

In particular, our study suggests how multi-vocality in meaning-making processes, i.e. the notion that "artifacts are interpretively flexible" (Ferraro et al. 2015, p. 375), may be dealt with. In line with other studies, our findings show that "meaning is not inherent to an artifact, but is constituted through an ecology of interactions between actors" and that not least "the concept of 'sustainable development' provides an example of multivocal inscription" (p. 375) (see also Ansell, 2011). However, whereas the role of multi-vocality in inviting a diversity of actors into meaning-making processes has been understood (see e.g. Banerjee 2003, Hoffman and Bazerman 2007), we add to this body of literature by showing how multi-vocality is collectively 'managed' in a modular fashion allowing to balance the need for interpretive flexibility and a workable consensus on the boundaries of that flexibility. For example, while there is ongoing ambiguity around what 'economic sustainability' means, we show that the emerging consensus on the need for addressing 'economic benefits for farmers' as part of that dimension establishes a "container"

for meaning-making processes. Through such "containers", interpretive processes get filtered as more or less relevant and meaningful. In other words, we add the idea that modularity gives meaning-making processes an overall direction, while still allowing for a certain spectrum of interpretations.

Our findings also have important implications for policy-making. *First*, they indicate that standard-setters take an increasingly important role not only in *implementing* – both domestic and global – policies towards promoting sustainability transitions (see also Kivimaa, 2014), but in *making sense* of policy objectives vis-à-vis both global and local stakeholders. In this regard, policy-makers need to be aware that, more than ever, corporate actors will participate in these governance processes and thereby try to gain ownership in ambiguous policy arenas, such as sustainability. *Second*, our findings imply that a modular governance approach at the level of policy-making may in fact reduce ambiguity facing implementing actors on the ground and also facilitate negotiation processes. Building modularity into policy instruments may be useful to accommodate multiple actors and encourage their local experimentation while being able to steer the overall process. A modular approach also helps evaluate the effectiveness of specific policies independently from other objectives and helps, over time, build reflexivity at the policy level. Governance modules that prove to be ineffective or counter-productive may be more flexibly changed than abandoning an entire policy mechanism. *Third*, and relatedly, they may help narrow the gap between sustainability-related policies and experiences of 'sustainable practice' on the ground. A modular approach may help 'break down' policies into feasible entry modules vis-a-vis more 'advanced' objectives, as a result of negotiations with experts on the ground, and thus help better manage the complexity of sustainability transitions.

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TABLES AND FIGURES

Table 1: Standards Overview

Standard-setter	AAA Sustainable Quality	4C Association	Starbucks C.A.F.E. Practices	Fairtrade	Organic	Rainforest Alliance	UTZ Certified
Main Objective	Secure the future supply of the highest quality coffee.	Baseline standard to eliminate worst practices.	Reward high-quality sustainably grown coffee.	Seek an alternative approach to conventional trade. Development/ Poverty alleviation.	Promote a production system that sustains the health of soils, ecosystems and people.	Conserve biodiversity and ensure sustainable livelihoods.	Sustainable farming and better opportunities for farmers, families and our planet.
Compliant Coffee produced 2012	247,114 MT	1,782,058 MT	457,339 MT	430,000 MT	248,767 MT	348,793 MT	715,648 MT
% of global production (40% total)	3%	22%	6%	5%	3%	4%	9%
Target Group	High-quality coffee growers	All coffee producers	High-quality coffee growers	Smallholder producers	All coffee producers	All coffee producers	All coffee producers
Standard Launch	2003	2004/2007	1995	1988/9	1972	1995	1997
Initiator	Firm (Nespresso)	Government/ Industry	Firm (Starbucks)	Social Movement/ NGO	Social Movement/ NGO	Social Movement / NGO	Firm (Ahold Coffee company)
Initiated in	Switzerland	Germany	USA	Netherlands/ Mexico	Germany	USA	Netherlands
Monitoring/ Labeling	Verification only	Verification only	Verification only	Certification + Label	Certification + Label	Certification + Label	Certification + Label

Table 2: Consensual and Contested Governance modules among Standard-Setters

	Consensual modules	**Changes to consensual/contested**	**Contested modules**
Environmental	Abolishment of 'banned pesticides' Reduction in agrochemical use Cutting of primary forest or destruction of other forms of natural resources that are designated by national and/ or international legislation Soil conservation practices Water conservation & wastewater management	← Land clearing restrictions ← Conservation of biodiversity → Abolishment of ALL pesticides and fertilizers (Chemical-free agricultural production) (Organic, Bird friendly) ← Carbon sequestration ← Energy conservation	Shade-grown practices (Bird Friendly, SAN/Rainforest Alliance) Prevent/remedy soil erosion and water salinization (Organic) Ban on GMO (Organic, Bird Friendly, Fairtrade, SAN/Rainforest Alliance) Ecosystem and wildlife preservation Organic seed and plant materials
Social	ILO Core Conventions: (1) Freedom of association and right to collective bargaining; (2) Elimination of all forms of forced or compulsory labor; (3) Effective abolition of child labor; (4) Elimination of discrimination in employment / occupation Access to safe drinking water at work; Legal minimum wage & working hours; Occupational health and safety	← Local community development ← Access to basic education for children ← Adequate housing if required (ILO 110)	Social premium (Fairtrade) Living wage Majority of producers are small farmers (Fairtrade) Democracy, participation, and transparency in farm organization (Fairtrade)
Economic	Economic empowerment (market access, information, commercial training) Immoral transactions in business relations according to international covenants, national law and practices (OECD Guidelines for Multinational Enterprises and UN Convention on Contracts for the International Sale of Goods)	← Improved product quality ← Traceability of coffee / Chain of Custody ← Producer income and profitability ← Business opportunities (market access, technical assistance) ← Premium price for farmers	Monitoring of coffee quality (4C, UTZ Certified, Starbucks, e.g. Starbuck's beans required to have a screen size > 15 mm with consistent color and zero defects) Guaranteed minimum price (Fairtrade) Business opportunities (Pre-financing by buyers) (Fairtrade)
Implementation	'Credible' monitoring Traceability Farmer training through intermediaries (e.g. traders, agronomists)	← Step-up process of certification ← Impact assessment (e.g. COSA cost-benefit analysis; ISEAL Impacts Code) ← Continuous improvements (e.g. varying timelines for compliance)	Third-party certification ISO 65 accreditation for certifiers Minimum conversion (organic, e.g. 18 months)

Figure 1: Dynamics Underlying the Emergence of a Modular Governance Architecture