Impact assessment of commodity standards: towards inclusive value chains

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Voluntary commodity standards are widely used to enhance the performance of tropical agro-food chains and to support the welfare and sustainability of smallholder farmers. Different methods and approaches are used to assess the effectiveness and impact of these certification schemes at farm-household, village, cooperative, and regional level. We provide an overview of the results from robust impact studies on coffee, tea, banana, cocoa, and cotton certification programmes. Overall outcomes show rather modest net revenue effects for farmers, small direct income effect for wage workers, and contested sustainability effects. Most impact studies focus on primary sourcing, but devote less attention to changes in trust and governance throughout the value chain. Moreover, implications for gender issues and supply chain trust are not always fully addressed. In order to better understand these somewhat disappointing effects, we discuss different fallacies and drawbacks that affect impact studies concerning commodity certification programmes. Main attention is given to perverse incentives for intensification and specialization that arise from certification. Moreover, spillovers to other (non-certified) farmers and spatial externalities at landscape level may reduce net effects. Important secondary effects related to behavioural change (risk, trust) and local innovation dynamics are usually overlooked. Current practices in value chain development programmes should focus increasingly on dynamic effects of upgrading and improved market integration. New interactive impact assessment approaches (gaming, multi-agency simulation) that address integrated value chain relationships offer promising perspectives for real-time and systematic analysis of alternatives for smallholder value chain inclusion beyond certification.

Keywords: certification, commodity standards, tropical agro-food crops, impact, smallholders

CERTIFICATION OF CASH CROPS is increasingly considered as an attractive strategy for enhancing smallholder integration in tropical value chains and for improving value chain performance. Certification is based on the confirmation of specific characteristics of a person (professional expertise), an object (having certain intrinsic attributes), or an organization (with specific institutional features). Usually, certification is not based on a legal status, but recognizes an appreciated practice (defined as the standard) and provides a licence to operate that can be recognized and/or controlled and verified by an independent third party.

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Certification of commodities is used in many sectors (drugs, music, cosmetics, education) but has become particularly important in the agro-food sector. It started in the early 1900s with the certification of seeds that were considered critical to preserve genetic purity and maintain varietal identity (Parsons, 1985). Certification through the protected designation of origin (PDO) became important for products like wine and olive oil. In the early 1960s, certification became of major importance to safeguard product quality, hygiene, and safety, particularly with the launch of the hazard analysis and critical control points (HACCP) system. In the late 1990s, large food processors and retailers wanted to rely on large-scale certification as a means to guarantee stable quality of supplies from a wide variety of – sometimes remote – producers through harmonized standards like EurepGAP, BRC (British Retail Standard), and GlobalGAP. The latter scheme has been rapidly expanding from 18,000 producers in 2004 to 125,000 producers in 2012 (Masood and Brümmer, 2014).

While public regulation (such as Sanitary and Phytosanitary Standards and Technical Barriers to Trade) usually focuses on end-product requirements, voluntary standards (like Fairtrade, UTZ, and eco-labels) are considered an important vehicle to enforce specific production practices and handling procedures and to guarantee special defined product attributes throughout the value chain. Thus voluntary standards offer options for product differentiation and for obtaining a price premium by conveying a quality signal to the final consumers. Compliance with these standards intends to bring supply chain partners closer together, thus enhancing trust and thereby reducing transaction costs (less need for inspection) and risks (greater reliability of supply). A further step towards company standards (Nature's Choice by Tesco, Nespresso AAA, etc.) makes certification an instrument for market segmentation.

Procedures for assessing the effectiveness of voluntary standards are usually designed for verification purposes. In addition, impact is considered increasingly important for maintaining consumer confidence, and therefore serves as a tool towards public accountability. While these two objectives are largely static in nature, attention is gradually shifting to possibilities for using standards in a more dynamic framework to improve product quality, labour regimes, and organizational practices. In this respect, upgrading through innovation and learning based on knowledge exchange and capacity development between value chain partners are considered highly important. Consequently, standards are not only considered as an instrument for supporting certain achievements but become increasingly appreciated as a vehicle for stimulating behavioural change.

This article relies on different methods and approaches that can be used to assess the impact of product certification practices (such as propensity score matching, difference-in-difference, randomized control trials, real-time evaluation, value-chain gaming, and supply-chain simulation). We discuss the implications and drawbacks of these methods for obtaining key insights into the impact of certification programmes in multiple results areas. We distinguish between different scope of influence (individual, family, farmer/worker, chain, landscape, region, economy-wide) and between different outcome areas (i.e. welfare, sustainability,

inclusiveness, innovation). We conclude that these approaches offer specific insights, but also face important constraints for obtaining information regarding the more dynamic certification outcomes in terms of resource use adjustment mechanisms and behavioural responses.

The remainder of this article is structured as follows: First we look at the most important direct impact pathways for agro-food certification and summarize the results from different empirical studies. Then, we discuss the secondary adjustment effects at farm-household, local, and regional level that arise from certification and that tend to reduce the impact of standards. This is followed by an overview of the potential dynamic effects of certification on the behaviour of value-chain agents that may strengthen the capacity to reach impact through certification. Finally, we conclude that a balanced appraisal of potential risks and benefits of agro-food certification should consider a wide range of impact assessment mechanisms.

Impact assessment of certification: what does it show?

Impact assessment refers to the evaluation of the effects of specific measures, activities, or incentives on the target population (White, 2009). Better understanding 'what works, what doesn't, where, why and for how much?' is critical for designing and timely adjusting development policies and programmes. Robust impact evaluations rely on counterfactual analysis that includes a comparison between what actually happened and what would have happened in the absence of the intervention. This enables us to address cause-and-effect questions and acts as a control for potential selection biases and confounding factors that could have influenced the results. For the evaluation of the effectiveness of certification, comparisons are usually based on certified farmers versus neighbouring (and otherwise identical) non-certified farmers. Consequently, the registered changes in outcome from such 'difference in difference' analysis can be directly attributable to the intervention. Otherwise, impact assessment compares farmers that were certified in an early stage with farmers that received their certification in later periods (so-called pipeline approach).

Different methods and approaches have been used to assess the effectiveness and impact of these certification regimes at farm-household, village, and cooperative level (see Rijsbergen et al., 2016 for a concise overview). In the 1990s, most studies were based on interviews and case studies reporting early experiences with fair trade certification in coffee and bananas (Ronchi, 2002; Bacon, 2005). From 2000 onwards, a growing number of survey-based impact studies appeared that registered welfare and sustainability effects of different types of certification for smallholder producers in major agro-food commodities, such as tea, cocoa, cotton, fish, trees, fresh fruits, honey, nuts, and flowers (for systematic overviews, see Nelson and Pound, 2009; Chan and Pound, 2009; ITC, 2011; Tallontire et al., 2012; Oya et al., 2015). More recently, attention has been extended to the impact of certification on wage labourers engaged in coffee farms and on banana plantations (SOAS, 2014; van Rijn et al., 2016). Some studies are applying randomized controlled trials (RCTs) to assess

the role of certification for consumer willingness to pay a premium (Jayawardhenaa et al., 2016). In a similar vein, RCTs can be used to assess the willingness to pay for reducing environmental footprints (carbon labelling, see Gadema and Oglethorpe, 2011). At the producer end, some field studies rely on experimental games in order to get greater insights into the impact on risk attitudes, trust, and intra-household bargaining (see Ruben and Hoebink, 2015).

With the proliferation of labels, attention has shifted to comparative studies that assess differences in performance between standards (e.g. between Fairtrade, Rainforest Alliance, and UTZ) within and across regions. International markets for agricultural commodities are becoming increasingly demanding in terms of quality and production conditions, whether related to social or environmental sustainability (Henson and Humphrey, 2010). Therefore, in addition to the measurement of direct income or welfare effects, due attention is given to environmental effects (soil erosion, pesticides use) and to climate change preparedness. Moreover, social standards try to enforce the elimination of child labour and payments that guarantee a decent living wage. Most standards are organized around the International Social and Environmental Accreditation and Labelling organization (ISEAL) with the objective of harmonizing some norms and practices around certification and sharing common procedures for assessing impact through a 'principle-criteria-indicator' system.

Given the wide range of certification schemes, certified products, and countries involved, it is not surprising that impact evaluation studies reach rather different results. Many studies report mixed findings with some positive and other negative elements, and cases where effects are only marginal (Tallontire et al., 2012; Nelson and Martin, 2013). Some studies even found that certification schemes may actually undermine the incomes of the poorest farmers (Henson and Jaffee, 2008), some report significant impacts for some – mainly private and organic – certification schemes, but not for others (Chiputwa et al., 2015; Ruben and Zuniga, 2011). Moreover, several studies find effects only for richer farmers (Hansen and Trifković, 2014), while others argue that certification schemes help raise rural smallholder incomes and reduce chronic poverty (Maertens and Swinnen, 2009). In a similar vein, some impacts of certification on environmental indicators (soil erosion, deforestation, biodiversity) are acknowledged, but overall effects are difficult to trace (Blackman and Rivera, 2010).

In order to be able to judge the different outcomes, we provide some illustrations of how different types of interventions, which are used by different certification schemes, may affect intended outcomes, and therefore reconstruct the assumed causal chains. Oya et al. (2015) and Sirdey and Lemeilleur (2015) distinguish six major impact pathways (see Figure 1):

- *Prices*. Certificates that guarantee a floor price (Fairtrade) or offer a quality premium (UTZ, RFA) are expected to contribute to more stable or higher farm gate prices, which may result in better net profits for agricultural producers, if they are not offset by higher input costs or certification costs.
- *Contracts*. Long-term delivery contracts that include pre-payment (before harvest) and credit provision (or can be used as a collateral for borrowing) will

improve market access to guaranteed outlets, enhance income stability, and reduce vulnerability to shocks. These effects may result in higher income and consumption at household level.

- *Premium*. The premium paid on top of the minimum price is invested by farmers and workers' organizations mainly in collective goods (social, environmental, and economic infrastructures), leading to possible better working conditions, greater education and health access, and/or improved production or marketing efficiency.
- *Product quality*. Technical assistance and capacity building for improved farming practices (including environmental standards through organic farming) give access to better remunerated market segments and thus lead to higher agricultural incomes and strengthened market power of beneficiaries.
- *Producer organization*. Standards that support cooperative organization and organizational improvements can result in strengthened governance in terms of their legitimacy through democratic member participation. The cooperative capacity to negotiate may reinforce members' empowerment and improve access to markets and better services.
- *Working conditions*. Standards can directly impact (wage and family) workers' well-being through better living wages and safe working conditions (e.g. provision of basic health services and maintaining safety in handling of toxic materials).

The underlying logic of these impact pathways for certification is based on a set of underlying key assumptions that suppose that: (a) farmer training leads to better farming practices; (b) the market recognizes quality improvements and sustainable production; (c) cooperative organization indeed reinforces bargaining power; and (d) delivery contracts enable farmers to make more (farm and household) investments.

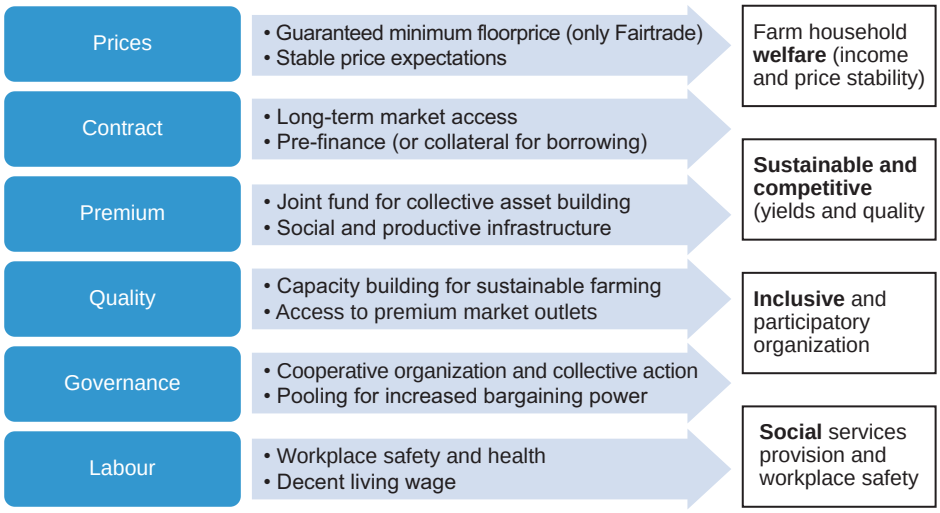

Figure 1 Impact pathways of agro-food certification

In practice, however, there are several reasons why our insights into the outcomes and impact of certification programmes are still rather limited. Most studies focus attention only on the primary production stage, while devoting less attention to changes in relationships and governance regimes throughout the value chain (Lemeilleur, 2013). Moreover, implications for intra-household (gender) issues and for democratic cooperative governance are scarcely addressed (Terstappen et al., 2013) and sustainability effects are usually only considered within farm boundaries (Blackman and Rivera, 2010).

Acknowledging these limitations, a fairly consistent picture tends to emerges from the set of robust impact studies that have been published during the last decade. We could summarize this evidence from empirical field studies in the following way:

- Improvements in farmers' welfare are rather modest, but price premiums tend to be higher for organic produce and for private labels that target premium market segments.
- Contributions of certification to more sustainable natural resource use and resilient farming systems are registered, but landscape-wide effects cannot be confirmed.
- Certification may lead to somewhat higher (farm and cooperative) operational investments, but access to long-term finance (provided by banks or trading partners) remains limited.
- Implications of certification for intra-household or cooperative equity are scarcely registered, while some limited adjustments in gender bargaining power could be reached.
- Some changes are registered in agency relationships between value chain partners; while quality compliance and lead time are improving, trust and reliability still need attention.
- Certification tends to increase demand for labour; wage payments to salaried workers are not significantly higher, but secondary benefits and work security may be better guaranteed.
- Costs of certification remain relatively high and are sometimes initially covered by donors or civil society organizations (NGOs); governance responsibilities and additionality of public support for private or voluntary labelling initiatives needs to be confirmed.

In summary, the evidence generated by impact studies regarding agro-food certification remains ambivalent and focuses mostly on some direct observable effects (prices, yields, wages, sales). Final impact of certification on household income and social mobility (poverty reduction) is even more difficult to ascertain, also because certified crops only represent a – sometimes small – share of land and revenue streams. In practice, only intermediate outcomes (like participation in training, access to support services, application of improved practices) are reported.

Even less attention is given to the systematic verification of the underlying assumptions for achieving impact, to the secondary effects of certification at farm, village, and regional level, and to the possible behavioural implications

Table 1 Impact fallacies and result biases of commodity standards

Secondary effect	*Over-estimation*	*Under-valuation*
Farm-level resource reallocation	X	
Disloyalty and side sales	X	
Copying behaviour and spillovers	X	
Over- and multi-certification	X	
Reduced risk averseness		X
Reliability in value chains		X
Innovation towards sustainability		X
Gender equity and living wage		X

of certification (e.g. on risk attitudes, willingness to invest, bargaining power, trust, etc.). These secondary and dynamic – sometimes hidden – effects will be discussed in the following sections. Table 1 provides a systematic overview of the different types of effects and their likely implications for impact analysis.

Impact assessment and responses to certification

In order to better understand the somewhat disappointing impact of agro-food certification programmes, we need to understand better the different fallacies and drawbacks that commodity certification programmes meet in practice. We argue that important dynamic effects and adjustment behaviour fall outside the common scope of impact studies and therefore tend to be systematically neglected or overlooked. Main attention will be given to the implicit incentives of certification for adjusting farm management practices, the implications for cooperative and village governance, the regional effects of certification for (non)certified farmers, and the market adjustment effects that result from successful certification.

Farm-household responses: intensification and specialization

Certification is targeted towards commercial commodities that receive a premium. The common household response to certification is to increase specialization in certified cash crops, usually by reducing cultivated areas and labour allocation for the production of food crops and other cash crops. Farmers that shift to organic production systems also need far more (family) labour for crop maintenance and phytosanitary care. Consequently, farmers may depend on revenues derived from certified crops for 75–80 per cent of their income.

Most impact studies only register net income effects at crop level. Studies that include full household expenditures tend to find substantial substitution effects that could almost fully outweigh the benefits of certification. Ruben and Hoebink (2015) find that UTZ-certified coffee farmers in East Africa are more inclined toward specialization, while Fairtrade producers usually maintain some degree of crop and activity diversification. If market prices for certified crops become reduced, farmers

that are more specialized strongly suffer. This will take away their incentives for innovation and thus restrict in the long run their comparative advantage. This may explain the limited (and sometimes even negative) net returns to certification.

Local responses: governance and sustainability

Most voluntary certification programmes rely on local cooperative structures to deliver farmer training and to guarantee efficient collection of crop harvests. Premium payments are also channelled through cooperative or village structures. At least part of the impact of certification can therefore be attributed to improved local governance regimes. However, many cooperative members prefer to receive individual benefits and could easily become disloyal if other market outlets offer better prices or immediate cash payments. Most cooperatives have limited resources and can only pay for part of the harvest – usually with a bank cheque – on delivery, while the second payment is received only after several months. Due to the absence of pre-finance in most certification schemes, cooperatives lack the cash resources to pay farmers upon delivery. This invokes substantial 'side sales' that affect internal cooperative coherence and reduce the contractual reliability of scheduled market deliveries by the cooperative.

Spatial externalities of certification are particularly important with respect to the common rules at village and regional level for sustainable resource management. Organic farming and biodiversity conservation require intensive neighbourhood coordination, while watershed management can only be effective if full villages participate. Therefore, some programmes now focus on 'landscape labelling' to guarantee integrated ecosystem management with broad community participation (Milder et al., 2015). Payments for ecosystem services are then merged with product certification and community-based conservation in order to extend the economic, social, and environmental benefits of certification beyond the certified farms (Ghazoul et al., 2009). The effective application of such schedules is highly dependent on local socio-cultural and geo-political circumstances.

Regional responses: copying and spillovers

Certified farmers are rapidly increasing in number and in market volume, since the premium for certification attracts a large group of farmers. Opportunities for obtaining certification enables market access for farmers that are affiliated to registered cooperatives. Therefore, in some areas, rather marginal farmers may become part of (Fairtrade) certification programmes, thus reducing overall productivity and quality of deliveries.

On the other hand, local markets for production factors such as inputs and labour are strongly influenced by widespread certification, as demand for resources and on-farm employment is increasing, leading to rising (opportunity) costs and decreasing off-farm income. In a similar vein, market prices for certified crops might push upward local floor prices, especially if supply of certified commodities becomes dominant (in practice: >30–40 per cent of regional supply) and other market players need to compete for regular sourcing (Ruben and Fort, 2012).

Initial effects of certification tend to vanish after a few years, as neighbouring farmers may imitate the changes in cropping practices that proved to be rewarding in the market. These copying effects reflect a positive global effect at regional level, but reduce specific advantages for the certified farmers that did incur major costs for obtaining the certificate. In other places, private labels may step in and engage with farmers that originally delivered under voluntary standards, thus capitalizing on earlier certification efforts (Ruben and Zuniga, 2011; Kersting and Wollni, 2012).

Market responses: over-certification and multi-certification

Since certification tends to enhance both farm specialization and area expansion, the market supply of certified crops is rapidly increasing to such an extent that market saturation is already occurring. This is partly due to the commercial interest of certification agents whose income is related to the number of delivered certificates. Otherwise, the above-mentioned copying behaviour also provides autonomous incentives for over-certification. In Central America, de Janvry et al. (2010) find that the share of certified coffee sold as Fairtrade averages around 20 per cent and never exceeds 30 per cent. Similarly, Ruben and Hoebink (2015) conclude that in East Africa less than one-third of certified coffee can be sold at the higher 'certified' price.

Another response refers to the tendency of farmers and cooperatives to adhere simultaneously to different labels. Such multi-certification becomes feasible since conditions between different labels (Fairtrade, UTZ, Rainforest Alliance) are partly overlapping and – given over-certification – it may be attractive to be able to deliver to different market outlets. Of course it incurs additional costs to the producers, but the diversification of buyers may also reinforce their bargaining position.

In summary, these so-called secondary effects of certification can only be captured in studies that rely on time-series data and that are interested in how farmers are dealing with standards. Long-term studies based on panel data of certification are notably scarce (see Rijsbergen et al., 2016; Dragusanu and Nunn, 2014). The same holds for studies that analyse the coexistence of different labels in the same region and assess their comparative performance (Ruben and Zuniga, 2011). Certification bodies are mostly focused on auditing and seem less interested in adjusting behaviour at farm and regional level.

Based on the evidence from field studies enriched with some more analytical reviews of certification histories, two general conclusions emerge. First, many certification programmes generate rather heterogeneous effects at village and regional level because farmers' responses vary widely, depending on their resource endowments, risk attitudes, and adjustment capacities. Insights in this impact heterogeneity are usually lost if only average treatment effects are reported (Plewis, 2002). Second, resource adjustment effects at farm and cooperative level are usually not fully considered, thus overestimating the impact of certification and overlooking likely substitution effects and strategic behaviour. This may lead to an overly optimistic impression of the possible impact of commodity certification programmes if these are considered in splendid isolation from other local and (inter) national development trends.

Impact of value chain upgrading beyond certification

Whereas certification programmes provoke several secondary local adjustments that may reduce their immediate impact, there are also several other, more dynamic effects that capture behavioural change of value chain agents. These effects are not fully captured in the impact pathways outlined above and may lead to a more robust impact in the medium and long term. This is particularly the case if certification creates dynamic advantages at farm-household and cooperative level (e.g. increasing willingness to invest) and if certification reinforces upstream or downstream linkages with value chain partners (e.g. greater trust and higher reliability that reduce transaction costs and risks).

Many certification programmes focus on performance standards that require compliance with certain requirements for crop and field management practices (minimum fertilizer applications, maximum pesticides use, etc.). On the other hand, so-called 'improvement standards' seek gradual upgrading of product quality and reinforcing sustainability in the production, processing, and trading stages over the defined adjustment period. This enables value chain partners to work together towards upscaling the quality and sustainability targets and dividing the benefits of these efforts equally among them.

Current certification regimes are strongly focused on farm-level production practices and improvement of some village/cooperative services. This may be useful to increase the (short-term) comparative advantage of sourcing from certified farmers compared with non-certified farms, but might be insufficient to accomplish a (long-run) competitive advantage in trade (Kogut, 1985). The latter are of a more strategic nature and usually focus on intangible aspects of supply chain governance practices that enable supply chain actors to reduce transaction costs and risk.

Standards can play a particularly useful role in reinforcing the dynamic competitive advantage in tropical commodity chains. Organizational innovations (like diversified payments for different quality classes) are considered especially useful to enhance upgrading and strengthen loyalty and enable information exchange between value chain partners. Since most voluntary standards are internationally applied and reflect a pre-competitive nature, lead firms may prefer to shift to private standards as a strategy towards market segmentation through value chain upgrading (Hudson and Orviska, 2013).

Different potential effects of certification that could go beyond compliance refer to changes in behaviour of value chain partners. Insights in behavioural change can be revealed through impact research that relies on agency gaming or experiments (such as trust and bargaining games or experimental auctions; see Demont and Ndour, 2015). These changes become particularly important in value chains that are involved in (quality) upgrading processes that require joint investments and strong coordination (Ruben et al., 2006). In the following paragraphs we distinguish four key areas where these behavioural effects of certification tend to be most relevant (see also Table 1).

Risk attitudes and investment behaviour

Certification is expected to contribute to stable access to output markets, but also provides opportunities for better access to input and financial markets. This might

have important behavioural implications for farmers that reduce their risk averseness and increase their willingness to invest (Ruben and Fort, 2012). This change in risk attitudes is vital for enabling farmers to enter into the process of input intensification of cropping systems, which is required for quality upgrading and to guarantee more stable market deliveries.

The guaranteed minimum floor price that Fairtrade offers to producers tends to improve the income certainty of producers, but could also have perverse effects if farmers respond with greater areas under certification, resulting in an excess supply of the certified product. Moreover, given the already high degree of over-certification of fair trade production, if market prices fall below the price floor the proportion of coffee that the producers can sell as Fair Trade also falls (de Janvry et al., 2010). Although the price floor is meant to provide stability, farmers may still face risk and uncertainty due to fluctuations in the quantities they can sell.

Reducing risks is particularly important for enhancing input use and to enable farmers to get credit. The most important role of certification as a 'dual contract' that provides access to both input and output markets is sometimes overlooked. Some voluntary certificates include provisions for pre-finance (e.g. early payments to producers by traders/processors before the harvest) and certificates can be recognized as a suitable collateral for borrowing (Isakson, 2014). These commitments also increase the certainty of supply for downstream agents and can be very helpful for optimizing logistics planning and reducing underuse of installed processing, storage, and transport capacities.

Business innovation for sustainability

Certification tends to enhance the investment behaviour of value chain agents, and may also stimulate long-term investments that favour process innovation and sustainability. It is commonly believed that agro-food knowledge and innovation systems require simultaneous changes in market conditions, supply chain agents' attitudes, and governance regimes (see Vazques and Gonzales, 2015). Commodity certification programmes are particularly useful for dovetailing these components into a consistent framework that provides incentives to all parties throughout the value chain.

Investments in sustainable resource management and environmental care are frequently part of voluntary certification programmes (Eco and Organic; Rainforest Alliance, etc.). Farmers' willingness to engage in sustainable production is clearly enhanced if downstream value chain partners can guarantee market outlets that are willing to pay premium prices. While sustainability is originally mainly related to characteristics of the product and its production process (using LCA methods), there is increasing interest in also considering spatial ecosystem externalities and thus shifting to landscape certification that includes attention to emissions, energy use, and food security (Ghazoul et al., 2009).

Reliability and trust in supply chain relationships

Possibilities for reaching impact through certification may also increase due to improved upstream or downstream value chain partnerships. Better reliability in

supplies through contract exchange is particularly important to control transaction costs. Certification is also expected to encourage trust between value chain parties (including opportunities for establishing brand trust). Higher trust may be translated into reduced internal control requirements and shorter lead times with substantial potential gains in terms of agrologistics procedures. Otherwise, trust is considered as a pre-condition for long-term investments in resource sustainability management and for enhancing cooperative climate change mitigation efforts that require coordination among different value chain agents (Sharfman et al., 2009).

Stronger intra-chain relationships may also be helpful to increase the bargaining position vis-à-vis other (external) stakeholders. Consequently, it may result in improved delivery contracts or higher market prices from retailers. This will be helpful to reduce the free-riding tendency of side sales by cooperative members and thus enhance internal cooperative coherence and trust. In a similar vein, relationships between farmers and upstream agents may be reinforced if the delivery contract can be used as a guarantee for timely input purchase and for obtaining credit.

Equity and gender for social participation

Participation of agents at different levels of the value chain is considered a critical condition for obtaining the envisaged benefits of certification. In the absence of sufficient scope for participation, it is likely that certain agents (cooperative leaders, male household heads, etc.) will be able to control major revenue streams. For guaranteeing equitable outcomes, it is therefore important to include some requirements for social participation – especially by female and wage workers – as a key element for obtaining commodity certification.

The immediate impact of certification is usually limited to direct product flows and the organization of production processes. Gender equality or decent living wages are becoming part of many codes of conduct, but more efforts could be devoted to their enforcement. Women's control over resources and income flows have increased, but social norms regarding intra-household decision-making procedures are more difficult to change (Lyon et al., 2010). For realizing the envisaged long-term outcomes in terms of improved nutrition and education, changes in social participation are considered a vital condition (Valkila and Nygren**,** 2009).

Outlook: future of value chain certification impact assessment

Standards are used to govern an increasing share of global agro-food trade, and have been interpreted both as market access barriers and as opportunities for low-income country producers, exporters, and workers. Donors have mostly chosen to treat them as opportunities and currently support a wide variety of programmes and projects aimed at supporting standards development and conformity (Bolwig et al., 2013). Major challenges that need to be addressed refer to the complexity of certification processes that require involvement of multiple players (farmers, business, NFOs, state) and the ambiguity of certification schemes that pursue simultaneously different goals (i.e. farmers welfare, quality upgrading, environmental care). These sometimes unrealistic expectations and inherent complexities

which frequently involve trade-offs ask for an impact analysis framework that mainly considers the catalytic effects of certification.

Recent impact studies seem to confirm that primary effects of certification are rather modest. Many certification programmes tend to underestimate the nature of the challenges faced and therefore significant impacts are only achieved under rather strict conditions. Consequently, results can be interpreted in an overly optimistic manner or otherwise important secondary effects can be overlooked. The solutions lie not only in more selective support to standard development and better-informed interventions, but also in focusing more squarely on smallholder adjustment options and strategic value chain responses in project planning.

Current practices in value chain development programmes tend to focus increasingly on the dynamic effects of upgrading (e.g. improvement standards that stimulate gradual increase in quality compliance) and the behavioural implication of better market integration (e.g. reduced risk, higher trust, and higher willingness to invest). New interactive impact assessment approaches (like gaming, multi-agency simulation, and economy-wide impact simulation) that focus on joint learning and adaptive value chain management have become available to assess potential development outcomes and to address integrated stakeholder relationships (Stern et al., 2012). These offer promising perspectives for real-time and forward-looking analysis of alternatives for smallholder value chain inclusion that expand their impact beyond certification.

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